A STRESS-DIATHESIS EXAMINATION OF INTERNET ADDICTION: PERCEIVED STRESS, THE BIG FIVE PERSONALITY FACTORS, PERFECTIONISM, AND INTERNET ADDICTION AMONG COLLEGE STUDENTS

By

TONG-AN SHUEH

A DISSERTATION PRESENTED TO THE GRADUATE SCHOOL OF THE UNIVERSITY OF FLORIDA IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

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To my father in heaven, Tso-Yun
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A STRESS-DIATHESIS EXAMINATION OF INTERNET ADDICTION: PERCEIVED STRESS, THE BIG FIVE PERSONALITY FACTORS, PERFECTIONISM, AND INTERNET ADDICTION AMONG COLLEGE STUDENTS

By

Tong-An Shueh

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Internet addiction has been a growing concern in the United States, and college students may be especially at-risk. This study focused on examining Internet addiction and its relationships with perceived stress, the Big Five personality factors, perfectionism, and other theoretically related personality variables among 1465 college students. Bivariate correlation analysis revealed that perceived stress was positively correlated with Internet addiction level. Results from hierarchical multiple regression analyses showed that Internet addiction was positively associated with neuroticism (higher-order personality factor) and maladaptive perfectionism (lower-order personality factor). Internet addiction also was negatively correlated with conscientiousness, extraversion, and openness (higher-order personality factors) and adaptive perfectionism (lower-order personality factor). A significant interaction was observed between perfectionism's two dimensions, discrepancy and standards, in predicting Internet addiction. The findings are discussed in light of the stress-diathesis perspective and the Stress Response Dampening Model. Limitations, future research directions, and implications for counseling practice are also addressed.
Since the Internet was first developed in 1966 (Roberts, 1995), it has grown rapidly and become the most dominant media for new generations. As the number of Internet users grows, some negative psychological symptoms among users have prompted psychologists to study “Internet addiction” in the last two decades. Internet addiction has also been proposed for inclusion in the upcoming Diagnostic and Statistics Manual of Mental Disorders, Fifth Edition (DSM-V) (Young, 2007).

College students have been considered as the most at risk for Internet addiction. Young (2007) suggested that college students are more vulnerable to Internet addiction because of free and unlimited Internet access, huge blocks of unstructured time, their newly experienced freedom from parental control, no monitoring or censoring of their online behavior, full encouragement from faculty and administrators, social intimidation and alienation, and also a higher legal drinking age that results in fewer stress relief outlets. Although college students have been suspected to be at high risk for Internet addiction (Castiglione, 2008), studies show that the prevalence rate of Internet addiction among that group has varied considerably, from less than 1% (Nichols & Nicki, 2004) to over 18% (Niemz, Griffiths, & Banyard, 2005). The inconsistent prevalence estimates may be due to researchers’ various approaches to conceptualizing and assessing Internet addiction.

Many studies about Internet addiction have been conducted on college students. Results indicate that Internet addiction is related to factors such as time spent on the Internet, gender, attitudes toward computers, and to some other social-psychological variables and problems (Chou, Condron, & Belland, 2005). Although various traditional
addiction theories and models have been used to explain Internet addiction among college students, a theoretically based investigation from the stress-diathesis perspective has not been explored. Therefore, this study aims to examine Internet addiction among college students focusing on both stress and pre-dispositional personality factors and to especially explore the potential moderating roles of lower-order personality variables such as perfectionism.

In the following sections, the literature regarding conceptualization, diagnosis, and symptoms of Internet addiction will be reviewed. In addition, possible factors associated with college students’ Internet addiction will be examined.

**Internet Addiction**

**Defining Internet Addiction**

**Terminology**

Although Internet addiction is now widely recognized, scientific studies for this phenomenon only started a little over a decade ago. Various terms have been used by researchers studying problematic Internet use (Byun et al., 2009; Chou et al., 2005). Although “Internet addiction” has been the most popular term (Byun et al., 2009; Chou & Hsiao, 2000; Chou et al., 2005; Soule, Shell, & Kleen, 2003; Thatcher & Goolam, 2005; Young, 1998b), other common terms have been used, including “Internet addiction disorder” (Goldberg, 1996), “pathological Internet use” (Davis, 2001; Morahan-Martin & Schumacher, 2000), and “Internet dependency” (Anderson, 1998, March; Scherer, 1997). This literature review will include studies using these common terms; however, the term, “Internet addiction” will be used throughout the writing for the ease of discussion.
**Definition**

There is not a standardized definition of Internet addiction among researchers; although most agree that the phenomenon does exist (Chou et al., 2005). In Chou and colleagues’ review, they mentioned that Internet addiction can be defined as “a psychological dependence on the Internet, regardless of the type of activity once logged on” (Kandell, 1998, p 12). Problematic use of the Internet is characterized by one’s inability to control the dependence and therefore leads to emotional distress and daily function impairment (Shapira et al., 2000). Internet addiction is also characterized by the compulsive use of the Internet to the degree that it interferes with one’s ability to lead a normal life (Rice, 2005). A more holistic definition of Internet addiction suggests that overuse of the Internet can impair individuals’ psychological states, which includes both mental and emotional states, as well as their scholastic, occupational, and social interactions (Beard, 2005).

**Conceptualization**

Addiction has been commonly and sometimes exclusively applied to the pathological dependence on a chemical substance (Bratter & Forrest, 1985; Marlatt & Witkiewitz, 2008). However, addiction can be broadly defined as a “compulsive, uncontrollable dependence on a chemical substance, habit, or practice to such a degree that either the means of obtaining or ceasing use may cause several emotional, mental, or physiological reactions” (Myers, 2006). Based on this definition of addiction, compulsive and uncontrollable dependence on the Internet can legitimately be conceptualized as a kind of addiction. In fact, it has been speculated that excessive Internet use similar to other out-of-control behavioral tendencies may share the same neurological mechanism with substance abuse (Holden, 2001). Widyanto and Griffiths
(2006) pointed out that Internet addiction can be conceptualized as a form of behavioral addiction (Douglas et al., 2008; Marks, 1990) under the generic umbrella term of “technological addictions” (Griffiths, 1996b, 1998, 2003); technology addictions are defined as behavioral addictions that involve human-machine interaction which can be passive, such as watching television, or active such as surfing online (Griffiths, 1995). Widyanto and Griffiths mentioned that technology addictions can exhibit typical addiction characteristics such as salience, mood modification, tolerance, withdrawal, conflict, and relapse (Griffiths, 1996a). The common component of both behavioral addiction and substance addiction is psychological dependence (Bradley, 1990; Marks, 1990; Shapira et al, 2003).

**Diagnosis of Internet addiction**

Young (1998b) mentioned that the diagnosis as well as the treatment of Internet addiction has been complicated due to the fact that the term, addiction, is not used in the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV), (American Psychiatric Association, 1994). Therefore, there are no official diagnostic criteria for Internet addiction. Kaltiala-Heino, Lintonen, and Rimpelä (2004) pointed out that some researchers adopted the diagnostic criteria of impulse control disorder such as compulsive gambling for the diagnosis of Internet addiction whereas diagnostic criteria of substance abuse disorders were used by other researchers.

**Diagnosis of Internet addiction using criteria of substance use disorders.**

Based on the rationale that substance dependence is the most similar term capturing the essence of addiction in the diagnosis of mental disorders (Walters, 1996), the seven diagnostic criteria of substance dependence in the DSM-IV were proposed as the workable model for the diagnosis of Internet addiction (Anderson, 2001; Young, 1996).
With the same underlying addiction conceptualization, Young (1996) suggested that people may develop Internet addiction as a substitute to other common addictions such as chemical dependencies and pathological gambling.

**Internet addiction as a kind of impulse control disorders.** The diagnostic criteria of impulse control disorders have also been adapted for the diagnosis of Internet addiction (Young & Rogers, 1998; Young, 1998a; Young, 1998b). It has been pointed out that the main diagnostic features for the impulse control disorder of pathological gambling closely resemble the main features of pathological Internet use (Young, 1998b). Shapira, Goldsmith, Keck, Khosla, & McElroy (2000) found that all subjects in their study of Internet addiction met the diagnostic criteria for an impulse control disorder (ICD), not otherwise specified. A high prevalence of features of impulse control disorders was also found among 86 Internet users who completed an evaluative online survey (Treuer, Fábián, & Füredi, 2001).

To diagnose Internet addiction, Young (1998) proposed adapting eight of the ten criteria used for diagnosing compulsive gambling; the diagnosis would be warranted if five of the eight criteria were met (Young, 1998b). In an attempt to strengthen the theoretical stance, Young’s initial adaptation was later modified regarding the number of necessary criteria (Beard & Wolf, 2001). Based on the diagnostic criteria of impulse control disorders in the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, text revision* (DSM-IV-TR, American Psychiatric Association, 2000) and the proposed compulsive buying diagnostic criteria (McElroy, Keck Jr, Pope Jr, Smith, & Strakowski, 1994), Shapira and colleagues argued that Internet addiction is a kind of impulse control disorder “in which an individual experiences rising tension or arousal
before Internet use and ... a sense of relief or pleasure after completion of the behavior” (Shapira et al., 2003, p. 212).

**Integrated diagnostic criteria from various disorders.** Internet addiction was once thought to be a variant on the spectrum of obsessive-compulsive disorders (OCD) (Goldsmith, Shapira, Phillips, & McElroy, 1998) that are often co-morbid with depressive disorders (Shapira et al., 2000). However, Shapira et al. found that Internet addiction among the 20 interviewed participants was more closely related to the symptoms of ICD rather than OCD in DSM-IV. Another surprising finding is the high percentage (80%) of participants meeting the lifetime criteria of bipolar disorder or schizoaffective disorder, bipolar type, but the relatively low lifetime rates of co-morbid major depressive disorder (15%) and OCD (20%) among these participants. Therefore, Shapira et al. concluded that Internet addiction can be better diagnosed with the criteria of impulse control disorder, not otherwise specified. Although this study used the somewhat qualitative semi-structured diagnostic interview to assess Internet addiction, Shapira et al. did not clearly describe their methodology and limitations. The conclusion seems rather dogmatic with such a small sample that consisted of participants with many comorbid psychiatric disorders, such as bipolar disorders.

Based on previous diagnostic criteria, studies, and clinical observations, a set of Internet addiction diagnostic criteria specific for adolescents integrated the criteria of substance dependence and impulsive control disorders (Ko, Yen, Chen, Chen, & Yen, 2005). Ko and colleagues indicated that these empirically verified criteria could be grouped into three main categories. Criterion A contains previously proposed symptoms such as preoccupation, uncontrolled impulse, usage more than intended, tolerance,
withdrawal, impairment of control, excessive time and effort spent on the Internet, and impairment of decision-making ability (Christensen, Orzack, Babington, & Patsoaughter, 2001; Hall & Parsons, 2001; Shapira et al., 2003). They mentioned that these symptoms are mostly in line with previously proposed criteria for behavior addiction (Goodman, 1993) and the diagnostic criteria for compulsive gambling in the DSM-IV (American Psychiatric Association, 1994); however, one symptom in Criterion A: “Excessive effort spent on activities necessary to obtain access to the Internet,” was modified based on the diagnostic criteria of substance dependence in the DSM-IV. They also proposed that one has to meet at least six out of the nine listed symptoms in Criterion A to be diagnosed as having Internet addiction. In addition, Criterion B includes the symptoms related to functional impairment whereas Criterion C concludes with the exclusive criteria to eliminate the possibility of psychotic disorders and bipolar I disorder (Ko et al., 2005).

More recently, Ko et al. (2009) modified their earlier criteria to be applicable to college students. They included two symptoms, preoccupation and uncontrolled impulse, which resemble diagnostic criteria of pathological gambling as well as seven other diagnostic criteria that are similar to the diagnostic criteria for substance dependence in the DSM-IV-TR. Ko et al. (2005) argued that Internet addiction seems to share core symptoms of substance abuse dependence and impulse control disorder, and that there is no sufficient evidence to classify Internet addiction only as an impulse control disorder. Due to the absence of validated diagnostic criteria, other researchers have incorporated diagnostic criteria from impulse control disorders, substance abuse, and obsessive-compulsive disorder in their description of Internet addiction.
However, Ko and colleagues (2005) suggested that including the criteria from multiple other disorders might set the diagnostic bar too high for the diagnosis of Internet addiction. For example, Aboujaoude et al. (2006) used four similar sets of criteria based on the three types of disorders and found that 3.7% to 13.7% of the participants endorsed one or more criteria whereas only 0.3% to 0.7% of the participants met the four sets of criteria entirely.

Overall, definitions of Internet addiction may vary due to various theoretical conceptualizations and clinical diagnostic propositions. This study will adopt Beard’s (2005) definition of Internet addiction because it has a more holistic view that encompasses both psychological aspects and daily functioning regarding Internet addiction. Conceptually, this study takes the stance that Internet addiction is a form of behavioral addiction (Douglas et al., 2008; Marks, 1990) that has the same psychological dependence as substance addiction (Bradley, 1990; Marks, 1990). Based on this conceptualization, this study adopts the diagnostic proposition of Internet addiction that follows the diagnostic criteria of substance use disorders because impulsive symptoms can be explained as the result of psychological dependence. It should be kept in mind that although this study uses the above-mentioned definition of Internet addiction, there will be some variations in the literature reviewed.

**Symptoms of Internet Addiction**

Based on Chou and colleagues’ (2005) review and other the empirical studies that have been conducted regarding Internet addiction, there are the following main symptoms of Internet addiction.
Poor time management

Because problematic Internet use is typically characterized by prolonged time spent on the Internet, time spent online was suggested as an important index to decipher Internet addiction (Chou et al., 2005). Many studies regarding Internet addiction have reported excessive time spent online among Internet addicts. For example, Young (1998) reported that Internet dependent participants spent a staggering 39 hours online per week, whereas Internet non-dependents only spent 5 hours online per week (Young, 1998b). In another study which attempted to develop an Internet addiction diagnostic instrument (Chen & Chou, 1999, August), it was found that the high-risk group spent 20 hours online per week, significantly more than the nine hours spent online per week by the none high-risk group. In addition, the degree of Internet addiction was positively correlated with the participants’ weekly Internet-use hours. Another study on Internet addiction among Taiwanese college students also found that the average time that Internet addicts spent online, 20 to 25 hours per week, was nearly triple the time of non-addicts (Chou & Hsiao, 2000).

The most obvious symptoms for people with Internet addiction is that they spend an excessive amount of time on the Internet and often have trouble managing time. Brenner (1997) argued that Internet dependent participants seemed to demonstrate some behavioral symptoms similar to tolerance, withdrawal, and caving that led to more time spent online. For example, 55% of the respondents have been told by others that they spend too much time on the Internet, 28% find it hard to stop thinking about the Internet if they had not used it in a while, and 22% of participants indicated that they attempted to spend less time online but were unable to do so. Significant differences about time management between Internet dependent and non-dependent students have
also been found. Kubey, Lavin, and Barrows’ (2001) study found that self-identified Internet dependent college students were statistically more likely than non-dependent students to agree on questions regarding time management, such as “Some people have suggested to me that I spend too much time on the Internet,” and “Sometimes I feel a little guilty about the amount of time I spend on the Internet.” Interestingly, these Internet dependent students spent almost three times as much recreational time online each week, 11.18 hours, compared to 3.84 hours for non-dependent students. Because of poor time management, these Internet dependent students reported that the Internet usually keeps them up late and they often feel tired the next day due to the excessive Internet use until late night. They indicated that it would be better if they spent less time on the Internet and admitted that they lacked control over Internet use.

**Poor academic performance**

Poor academic and professional performances have often been noted among Internet dependent users. In Young’s (1998a) study on college students, a staggering 58% of the participants reported that they suffered from poor study habits, poor grades, or failed school due to excessive Internet use. Kubey et al. (2001) found that 14% or 80 of the 572 college students in their study indicated that their school work had been negatively affected due to Internet use. The students who were most negatively affected reported more than double the Internet usage time than the average usage reported for the entire sample. Internet-dependent students were almost four times more likely than non-Internet-dependent students to report these academic impairments. When compared with students with no academic impairments, academically impaired students showed significant differences on many Internet related symptoms. They were more likely to stay up late and feel tired the next day due to Internet use.
Increased unhealthy behaviors

People with Internet addiction also seem to engage in many unhealthy behaviors. J.S. Kim and Chung (2005) studied Korean high school students and found that Internet addiction was negatively correlated to perceived health status. Compared with non-addicted students, those students with severe Internet addiction reported having poorer diet and nutrition intake, less regular exercise and sleep, reduced personal hygiene, fewer social relationships, less self-regulation, less emotional support from others, and less self-realization.

J.H. Kim et al. (2009) examined 2427 college students’ heavy Internet use and their health risk behaviors and health-promoting behaviors in a Hong Kong university. The result also showed that heavy Internet use was associated with significantly lower likelihood of engaging in health-promoting behaviors including attempting to eat a healthier diet, taking nutritional supplements, trying to increase physical activity levels, exercising regularly, and seeking immediate medical care when ill. Students with heavy Internet use were also less likely to adopt healthier personal habits including improving one’s hygiene, getting more rest, trying to reduce mental stress, and trying to maintain a regular daily routine. In addition, heavy Internet use was also associated with multiple health risk behaviors such as skipping meals and sleeping late, as well as poor health outcomes such as obesity and hypersomnia.

Disrupted interpersonal relationships

People with Internet addiction also seem to lose social interactions with others. In Young’s (1998b) study, 396 Internet dependent users reported their interpersonal relationship such as marriages, dating relationships, parent-child relationship and close friendships were disrupted by excessive use of the Internet. In Kraut and colleagues’
(1998) longitudinal study investigating 98 families and a total of 169 participants in their first year or two of Internet use, results showed that Internet use was consistently associated with small but statistically significant decreases in social involvement measured by communication with the family and the size of participants’ local social networks. Greater Internet use was also found to negatively relate to the participants’ distant social circle, social support, and stress level although the associations were not statistically significant. Based on the results, the researchers suggest that Internet use is a solitary activity used to increase one’s social sphere, yet it tends to actually reduce one’s social involvement. Although Internet users usually report using the Internet to engage in social activity online and therefore derive a sense of communication pleasure, this process results in self-confinedment to virtual communications and reduction in time engaging in real-life face-to-face social interactions (Davis, Flett, & Besser, 2002b).

**Psychological distress**

Based on Kraut and colleagues’ (1998) longitudinal study, more Internet use significantly increases feelings of loneliness and depression. Kraut and his colleagues used path analysis to test relationships between Internet use, loneliness, depression and other personal and demographic variables among the participants. They also found that initial loneliness and depression did not predict subsequent Internet use. However, Internet use significantly predicted increased loneliness and depression at a subsequent time after controlling demographic variables. Therefore, Kraut et al. concluded that loneliness and depression are consequences, but not causes of Internet use.

Kraut and colleagues (1998) also tested the relationship between Internet use and subsequent perceived stress (e.g., daily hassles). Although more Internet use
marginally predicted greater number of reported daily life stressors at the subsequent time ($p = .08$), the post hoc analysis of specific stressors did not reveal significant increase of any single stressor. Kraut et al. suggested that Internet use may increase aggregate stress, but it does not follow a common path to a specific stressor among the participants. The researchers did not report whether initial stress predicted subsequent Internet use.

**Demographic Factors Associated with Internet Addiction**

Among demographic factors, gender, age, years of Internet use have been associated with Internet addiction in previous studies. Therefore, these factors will be discussed in detail below.

**Gender**

There seem to be gender differences regarding Internet addiction vulnerability and types of Internet addiction. As Chou and colleagues (2005) pointed out in their review, most of the studies revealed that men are more likely to have Internet addiction. For example, Scherer (1997) found that 71% of dependent Internet users in her sample were men, whereas among non-dependent users, the gender ratio was evenly distributed at 50%. Another study also found that males were more likely to be pathological Internet users than females (12% males versus 3% females), whereas females compared to males were more likely to show limited symptoms (69% versus 61%) or no symptoms (28% versus 26%). In addition, males had a significantly higher average number of pathological symptoms than females (Morahan-Martin & Schumacher, 2000). However, there might be some sample problems for this difference. For example, even though regression analysis indicated males were more likely than females to be Internet addicts in one study (Chou & Hsiao, 2000), there were
only three female respondents out of the 54 Internet addiction cases in that study (Chou et al., 2005).

Interestingly, Chou and colleagues’ review also pointed out that this gender difference in Internet addiction did not show up in some other studies. For example, Brenner (1997) found that men and women did not differ in time spent online or in the number of problems they experienced (Brenner, 1997). In another study, Young (1998) found that there were even more Internet dependent women than men (Young, 1998b). However, these findings were criticized for using self-selected online samples which might have introduced stronger sampling bias (Chou et al., 2005). It was also pointed out that female researchers might have been able to recruit more female Internet addicts and that women are generally more willing to express their emotional problems than men (Griffiths, 1998). Overall, it was noted that different methodologies and sample methods might have affected whether gender differences were found. For instance, studies using paper-and-pencil questionnaires on college campuses tend to show that males are more likely to be addicted to the Internet whereas online studies with a diverse population usually revealed no gender differences (Chou et al., 2005). This could be due to either sampling issues or social desirability factors.

Chou and colleague’s (2005) review also pointed out that gender differences may be reflected in unique patterns of Internet addiction. More men than women appeared drawn to the interactive online games that highlight power, dominance, control, and/or violence. In addition, although men would tend to explore sexual fantasies online, women sought out close friendships and romances through anonymous online communication (Young, 1998b). Another study indicated that although time-
management problems and compulsion symptoms served as common predictors for both men and women, some unique factors predicted the time spent online for each gender. Specifically, shyness and withdrawal symptoms were the only predictive factors among the female college participants whereas previous Internet experiences and tolerance symptoms were only predictive for male participants (Chen, 2000).

**Age**

Internet usage seems to vary among people of different ages. In a national representative study in Italy, time spent on the Internet seemed significantly elevated for the adolescents and adults (Bricolo, Gentile, Smelser, & Serpelloni, 2007). Specifically, children aged 2 to 11 on average spent a total of 13 hours online each month whereas adolescents aged 12 to 20 spent 39 hours online per month. Adult males in two age groups, 35 to 44 and 45 to 55, spent 41 and 45 hours online, whereas adult females in two age groups, 30 to 40 and 41 to 51, spent 30 and 26 hours online per month. When examining the age group differences on their frequencies of staying online, about 23% of adolescents compared to 28% of adult males visited the Internet on any given day, whereas only 4% of children stayed on the Internet every day. Based on these descriptive statistics and the associations found between Internet addiction and time spent online, the likelihood of having Internet addiction seems to escalate since adolescence. In another study exploring the demographic characteristics of heavy Internet users, Internet users who were 20 or younger spent significantly more recreational hours online than users over age 20 (Soule et al., 2003). These studies suggested that age may relate to Internet addiction; however, these results have serious limitations because they are cross sectional so there is possibility that the
differences can be due to other generation related factors, such as one’s Internet use experience.

**Years of Internet use**

Internet addicts seem to have longer Internet using history than non-dependent people. Kubey et al. (2001) examined Internet addiction among college students and found that the ratio between Internet addicts and non-dependent Internet users became larger as the years of Internet using experience increased. Specifically, 79.2% of Internet dependent students indicated they had used the Internet for two to three years or longer, whereas only 55.1% of non-dependent students said the same. Among the Internet users who had used the Internet for four years or longer, there were almost five times more Internet dependent students (35.9%) than non-dependent students (7.5%). Lin and Tsai (2002) examined Taiwanese high school students’ Internet use and they also found that Internet dependent students had longer Internet experience. Among these Internet dependent students, 32% used the Internet for more than 2 years and almost 14% of them used the Internet for more than 3 years. Lin and Tsai interpreted these findings as indicative that the younger the individuals were when they started using the Internet, the more easily they became addicted to it. Although these studies show years of Internet use is related to Internet addiction, the results were only presented in simple descriptive analysis and t-test in categorical comparison between Internet dependent participants and non-Internet dependent participants. Studies using dimensional approaches can potentially clarify the relationship between years of Internet experiences and Internet addiction.
Stress and Internet Addiction

Addictions may develop in reaction to stressful and unpleasant life events, such as marriage problems or career issues (Fanning & John, 1996). Internet addiction, just like substance abuse addictions, may occur when people cope with stressful situations through temporarily relieving, escaping, or avoiding the unpleasant feelings (Young, 1999). Castiglione (2008) proposed the conceptual framework to view Internet addiction as a result of maladaptive stress-coping. However, due to the lack of research on the relationship between stress and Internet addiction, the relevant theories and research regarding stress and substance abuse addictions will be reviewed below.

Internet Use and Stress Coping

People may use the Internet to reduce their stress. Study results on Internet procrastination indirectly imply that Internet addiction may be a maladaptive stress coping symptom. Lavoie and Pychyl’s (2001) study about online procrastination, attitudes and emotion revealed that 50.7% of the respondents reported frequent Internet procrastination and on average respondents spent 47% of time online procrastinating. Specifically, Internet procrastination was positively correlated with perceiving the Internet as a relief from stress ($r = .57$), as entertaining ($r = .35$), and as an important tool ($r = .24$). In addition, using Internet to relieve stress was also positively and independently related to online entertainment ($r = .46$). Lavoie and Pychyl suggested that Internet users may procrastinate online by temporarily diminishing stress through entertaining distractions because procrastination in task avoidance serves to relieve task anxiety (Ferrari, Johnson, & McCown, 1995) and procrastinators would engage in some less stressful activity (McCown & Johnson, 1991). This hypothesis was adopted by researchers who studied Internet addiction (Davis, Flett, & Besser, 2002a, 2002b).
Distraction, procrastination, and problematic Internet use were found to be highly correlated (Davis, Flett, & Besser, 2002b).

Whang, Lee, and Chang (2002) conducted a large-scale study investigating psychological features of Internet users in Korea and found interesting associations between stress and Internet use. They divided participants into three groups based on their Internet addiction level: the addicted group (IA), the possible addicts (PA), and non-addicts (NA). When participants felt stressed by people, both the IA and PA groups reported more Internet use (IA, 21.2%; PA 14.3%) than the NA group (8.6%), whereas the IA and PA group reported a lower chance of meeting people (IA, 2.8%; PA 5.2%) than the NA group (6.2%). When participants felt stressed by work, again both the IA and PA groups had more Internet use (IA, 20.4%, PA, 16.6%) than the NA group (NA, 5.0%); however, the NA group reported more drinking of alcohol than the IA and PA groups (NA, 18.8%; PA, 16%; IA: 14.2%). Overall, the rates of reported Internet use were two to four times more for the Internet addicted group than the non-addicted group in stressful situations. Whang et al. suggested that people use different behavioral repertoires in different stressful situations depending on their Internet addiction level. Therefore, Internet addicts seem more likely to use Internet than other activities (such as drinking) to relieve their stress. This finding could be well explained by the Stress Response Dampening Model. However, the researchers in this study did not try to further examine which personality factors were related to the Internet addiction level.

Internet Addiction as A Way of Stress Coping among College Students

College students may be more vulnerable to developing Internet addiction due to various stresses they face. Kandell (1998) theorized that college students may develop Internet addiction to cope or resolve stressful challenges such as identity and intimacy
development along with academic pressure. Kandell suggested that the development of Internet addiction among college students due to these psychological and developmental dynamics seems especially facilitated by the ready access to the Internet and the expectation of computer/Internet use in college. A study investigating excess Internet use among undergraduate students in Pakistan found that 61% of the respondents indicated that they stayed online to forget their real life problems or to avoid stress, and 52.5% of them reported gaining great pleasure and satisfaction by being online. The researchers pointed out that more than half of the respondents seemed to prefer the online “nonhuman” interaction to real human relations and that they found the Internet consoling during times of stress (Suhail & Bargees, 2006).

Li, Wang, and Wang (2009) studied 654 Chinese undergraduate students’ general problematic Internet use and found that stressful life events seemed to contribute to Internet addiction. When comparing the 13.6% of respondents who were classified as Internet addicts with the other respondents, it was found that the frequency of stressful life events over the past 6 months was significantly higher in the Internet addicted group than the non-Internet addicted group. Group differences were most prominent in terms of academic stress, job-related stress, socio-communication, daily hassles, and major life events. In addition, the Internet addicted group also tended to use more avoidant coping such as self-blame, fantasy, withdrawal, and rationalization as well as less positive coping such as problem-solving and help-seeking. Further path analysis revealed that stressful life events contributed to these undergraduate students’ Internet addiction through those avoidant coping styles.
The Stress-Diathesis Perspective

The stress-diathesis perspective has been used to explain the development of Internet addiction (Davis, 2001). Based on the stress-diathesis theory (Rosenthal, 1963), Internet addiction could also be conceptualized as resulting from an interaction between pre-dispositions and stress. Finding pre-dispositional factors of Internet addiction is of tremendous value to help identify people who might be vulnerable to developing Internet addiction when facing stress. Although Davis (2001) theorized that the predisposition of Internet addiction could be attributed to the presence of another mental disorder and/or maladaptive cognition, most empirical studies have focused on predispositions in terms of personality tendencies. Based on the stress-diathesis perspective, the interaction effect of stress and the pre-dispositional personality factors regarding addiction has been intricately presented by the Stress Response Dampening Model.

Stress Response Dampening Model

Framing on the tension reduction theory of alcoholism, the Stress Response Dampening Model was proposed by Sher and Levenson (1982). In their initial two experiments, individual differences of physiological and affective responses to alcohol under stress conditions were found between high risk and low risk groups of alcoholism. Specifically, the high risk group showed pronounced reduction of stress responses in regards to cardiovascular readings and reported affective changes compared to the low risk group. In other words, alcohol’s stress-response-dampening (SRD) effect was more prominent for the high risk group. The researchers concluded with three findings. First, there were individual differences in alcohol’s SRD effect. Second, these individual differences were statistically significant and alcohol’s SRD effect was manifested by the
difference response patterns in the high risk group and the low risk group. Third, the individual differences were related to characteristics sampled by personality measures because the division of high risk and low risk groups were based on these personality measures. Although the physiological mechanisms are not clearly specified in the SRD model, the researchers proposed three basic components of the SRD model: a) risk for alcoholism is associated with certain personality traits, b) there are individual differences in the magnitude of alcohol’s SRD effect, and c) the development of alcoholism can be conceptualized in terms of reinforcement. They argued that individuals with certain personality traits would receive more of alcohol’s SRD effect biologically and thus, they would have great reinforcement for drinking. Once the reinforcement pattern had been established through the process of increased tolerance, it would lead to greater consumption, unpleasant withdrawal symptoms during attempts to stop drinking, and generalization of drinking behavior to a greater range of potentially stressful situations (Sher & Levenson, 1982).

Sher and Levenson (1982) proposed that individuals with outgoing, aggressive, impulsive, and antisocial personality characteristics would be predisposed to develop alcoholism based on alcohol’s SRD effect in their experiments. However, the personality measures they used could not differentiate risk to alcoholism from other types of drug addictions. Therefore, this opens up the applicability of the SRD model to other types of addiction. The SRD model could potentially be used to explain behavioral addictions such as Internet addiction, in light of the behavioral reinforcement conceptualization of addiction.
Personality Factors of Internet Addiction

Based on the stress-diathesis perspective, it would be important to explore how diatheses would contribute to the development of Internet addiction in addition to examining the relationship between stress and Internet addiction. Biological diatheses are usually represented by various pre-dispositional personality factors in the field of psychology. According to the SRD model (Sher & Levenson, 1982), it would also be important to figure out how individual differences regarding pre-dispositional personality factors result in addictive tendency when facing stress. Several pre-dispositional personality characteristics have been explored in the attempt of figuring out what may contribute to Internet addiction. And researchers have also started to explore what personality attributes may put certain individuals more vulnerable to Internet addiction than others.

The Big Five Personality Traits

In the study of personality traits, “the Big Five” (Goldberg, 1981, p. 159) personality theory provides a structural framework that is widely recognized. Although there are still arguments among researchers regarding the names of the five personality traits, the most known lexical labels of the five factors are “Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness” (McCrae & Costa, 1990, p. 176). The Big Five personality factors’ relationships with Internet addiction were examined in several studies.

Extraversion and related traits

Kraut and colleagues’ (2002) longitudinal follow-up study by found a moderating effect of extraversion on the relationship between Internet use and well-being. Specifically, extraverts who used the Internet more reported improved well-being such
as decreased loneliness, less negative affect, decreased time pressure, and greater self-esteem; however, introverts who used more Internet showed decreased well-being on these same indexes. A study of 122 German adolescents found that extraversion was only associated with greater motive to use Internet for interpersonal communication; however, neuroticism was associated with greater motivation to use Internet for entertainment purposes (Wolfradt & Doll, 2001).

Social anxiety has also been suggested to be one of the causes of Internet addiction. Caplan’s (2007) study examined the relationship between social anxiety and Internet addiction among 343 undergraduate college students (Caplan, 2007). The results indicated that social anxiety highly explained the positive correlation between loneliness and participants’ preference for online social interaction. Compared with gender, online gaming, and online gambling, participants’ preference for online social interaction was twice as strong as a predictor for problematic Internet use. Based on the results, the researchers suggested that socially anxious individuals would prefer online social interaction which would further lead to Internet addiction.

A similar construct, shyness, has also been proposed to predict Internet addiction. In Chak and Leung’s (2004) study of 722 Internet users, shyness was found to be associated with a moderate but statistically significant increase in Internet addiction; however, interestingly, shyness did not seem to predispose them to higher communicative Internet usage. This contradicts previous allegations that Internet addicts seek out online communications (Chou, 2001). Surprisingly, shy male participants actually used e-mail, ICQ, and chat room services less. The researchers commented that the results indicate that shy people may not find it easier to
communicate online; they may not seek out online communication, but rather they may be addicted to the other Internet applications for recreational or leisure purposes. In addition, the study did not find a significant relationship between shyness and time spent online. It is worth noting that the researchers also explored a related personality construct, locus of control and discovered similar patterns: participants with external-oriented locus control were more prone to Internet addiction and online gaming, but not Internet use in general.

**Extraversion and neuroticism**

Hamburger and Ben-Artzi’s (2000) study on 72 college students’ Internet usage revealed that extraversion was positively associated with the use of leisure services online but neuroticism was negatively related to the use of information services online. Furthermore, men and women showed different patterns regarding the relationships between personality traits and Internet usage. For men, extraversion was positively associated with use of leisure services online whereas neuroticism was negatively associated with use of information services. For women, extraversion was negatively related to use of social services online, but neuroticism was positively related to use of social services online. Amichai-Hamburger and Ben-Artzi’s (2003) study on 85 Internet users that examined the patterns mentioned above found similar but somewhat different results. For the whole sample and for male participants only, extraversion was positively related to use of information and leisure services online. For women, neuroticism was positively related to use of social services online.

Hardie and Tee’s (2007) online survey on 96 adults examined the role of personality, loneliness, and social support networks for Internet addiction. This study revealed that Internet addicts and over-users compared to average Internet users were
significantly more neurotic, less extraverted, and more socially anxious. However, based on a hierarchical multiple regression analysis, only neuroticism and perceived support from online social networks were significant predictors for Internet addiction (Hardie & Tee, 2007). Although these findings are informative, the smaller sample sizes of these studies raise some questions whether these findings are reliable and/or generalizable.

**The conscientiousness related trait: sensation seeking**

Zuckerman, Kuhlman, Joireman, Teta, and Kraft (1993) proposed the Alternative Five factor model that has four comparable constructs with the Big Five model. The Alternative Five model’s Impulsive Unsocialized Sensation Seeking (ImpUSS) was expected to be negatively related to conscientiousness in the Big Five model. Since this study adopts the Big Five model’s personality structure framework, literature regarding sensation seeking will be categorized under the label of conscientiousness. As in the literature regarding substance abuse addiction, sensation seeking has been suspected as an important reason for Internet addiction. However, the results have been inconsistent (Chou et al., 2005).

Lavin and colleagues investigated the association between sensation seeking and Internet dependence on 342 college students. Contrary to the researchers’ hypotheses, the findings showed that Internet dependent students actually scored significantly lower than non-dependent students, not only on the overall sensation seeking score but also on the thrill and adventure seeking and excitement seeking. The researchers explained that the surprising results could stem from various sources. First, the Internet dependent students’ characteristics could be conceptualized as sociable rather than sensation seeking. Second, the instrument used to measure sensation seeking might not be able
to assess non-physical sensation seeking behaviors (Lavin, Marvin, McLarney, Nola, & Scott, 1999). Chou et al. (2005) also pointed out that the measure used to differentiate non-dependent and dependent Internet users in this study lacks some Internet addiction components such as tolerance, withdrawal, and other related problems.

Lin and Tsai (2002) found somewhat different results in their study of 753 Taiwanese high school students. Specifically, Internet dependents had significantly higher overall sensation seeking scores and higher dis-inhibition scores (a subscale of sensation seeking) than the non-dependents; however, no group differences were found on sensation seeking in terms of the life experience seeking, and thrill and adventure seeking. The researchers suggested that Internet addiction could result from the developmental need for these Internet-dependent Taiwanese adolescents to strive for personal identity through breaking social inhibition online.

Another characteristic similar to sensation seeking for Internet addiction is pleasure seeking and gratification of needs. Chou, Chou, and Tyan’s (1999) study examined the relationship between communication pleasure and Internet addiction. The results showed that participants’ Internet addiction scores were positively related to their scores on escape pleasure, interpersonal relationship pleasure, and total communication pleasure. The researchers interpreted the findings based on Stephenson’s *Play Theory of Mass Communication* (Stephenson, 1988) and concluded that Internet addiction resulted from individuals who used the Internet to seek communication pleasure experience. Chou and Hsiao’s (2000) large scale longitudinal study was conducted on 910 Taiwanese college students to further examine Internet addiction and pleasure gratification. This study found that Internet addicted students
had significantly higher communication pleasure and satisfaction scores than the non-addicted students. Communication pleasure scores and satisfaction scores along with BBS use hours, email use hours, and gender were found to be the most powerful predictors for Internet addiction among the participants. These findings suggest that Internet addiction may be related to one’s sensation seeking tendency on the aspect of communication pleasure.

**Other related personality factors**

Young and Rodgers’ (1998) online survey study investigated 259 Internet dependent users’ personality traits using the Sixteen Personality Factor Inventory (16PF). The study results showed that Internet dependent users ranked high on personality traits such as self-reliance, emotional sensitivity and reactivity, vigilance, low self-disclosure, and non-conformist. The authors indicated people with such personality traits may be predisposed to fulfill their unmet psychological needs through online stimulation.

Ko and colleagues’ (2006) cross-sectional study compared the different patterns of personality characteristics among 3412 Taiwanese high school students who either had Internet addiction, substance abuse addiction, or both. The results indicated that there were no significant personality differences between the substance abuse group and the co-morbid group. When compared with students without substance abuse addiction, students with substance addiction had significantly higher novelty seeking, lower harm avoidance, and lower reward dependence. Interestingly, students with Internet addiction also had higher novelty seeking and lower reward dependence compared with students without Internet addiction; however, students with Internet addiction in particular showed higher harm avoidance than their counterparts. The researchers suggested that
individuals with Internet addiction might use the Internet to avoid stress and to alleviate a fear of real life harm (Ko et al., 2006).

Ko and colleagues (2007) conducted another longitudinal study examined how personality factors might affect the occurrence and remission of Internet addiction among 517 high school students in southern Taiwan (Ko, Yen, Yen, Lin, & Yang, 2007). For those participants who did not have Internet addiction initially, high exploratory excitability, and low reward dependence predicted the emergence of Internet addiction. Specifically within the construct of reward dependence, these participants had significantly lower scores on sentimentality and persistence subscales. The researchers explained that the immediacy and predictability of Internet activities might have rewarded these adolescents with impaired reward response. For those participants who initially had Internet addiction, low hostility and low interpersonal sensitivity predicted remission of Internet addiction. The researchers interpreted low interpersonal sensitivity as low interpersonal anxiety and indicated that these two personality characteristics could be protective factors for Internet addiction. The noteworthy non-significant findings in this study are that the scores of overall novelty seeking and harm avoidance did not predict the occurrence of Internet addiction, which contradict the previous cross-sectional findings (Ko et al., 2006).

In conclusion, the studies exploring the effects of personality factors on Internet addiction have been inconsistent. One study actually found no associations between the Big Five personality dimensions and Internet addiction measures (Engelberg & Sjoberg, 2004). However, this inconsistency is not that surprising when considering the literature regarding the effects of personality factors on substance abuse addiction. Personality
factors such as neuroticism or negative emotionality, impulsivity or disinhibition (e.g., sensation-seeking), and extraversion or positive emotionality have been suggested to potentially predispose people in developing alcoholism or substance abuse addiction; however, the attempt to find an addictive personality has been not successful (Ibáñez, Ruiperez, Villa, Moya, & Ortet, 2008).

There have been great inconsistencies across studies for the link between these main personality dimensions and substance abuse addiction even though some combination of these higher-order personality traits could be carefully interpreted as risk factors for the later development of alcoholism and substance abuse addiction (Chassin, Flora, & King, 2004).

Due to the inconsistent results regarding proposed higher-order personality factors for addictive personality, Rice and Van Arsdale (2010) have recently suggested that a refined examination of personality factors focusing more on lower-ordered personality factors and their moderating effects can better reveal the contributions of personality on addictive behaviors. Perfectionism is one of the promising lower-order personality factors that may be closely related to addictive behaviors. Clinically, many substance abuse addiction patients exhibit characteristics of perfectionism such as extremely high standards and distress for the discrepancy between standards and behaviors. Surprisingly, there is a lack of theories and studies regarding this common clinical observation. In one recent study, Rice and Van Arsdale proposed that perfectionism as a lower-order personality factor is a good candidate in studying addiction because it relates to higher-order personality factors such as conscientiousness and neuroticism which are conceptually related to substance abuse addiction. Therefore, focusing on
perfectionism may potentially bridge the literature gap regarding addictive personality factors for Internet addiction. In addition to exploring the high-order personality factors’ associations with Internet addiction, the effect of perfectionism on Internet addiction would also be one main area that could possibly further the literature of Internet addiction. The construct of perfectionism as an important lower-order personality factor for Internet addiction will be discussed in the following section.

**Perfectionism and Internet Addiction**

The relationship between perfectionism and Internet addiction has not been specifically examined in published literature; therefore, literature regarding to substance abuse addiction and behavioral addictions will be reviewed to help understand the possible relationship between perfectionism and Internet addiction. Specifically, the relationship between perfectionism and Internet addiction will be discussed through the stress-diathesis perspective. Among the lower-order personality factors, perfectionism is a good candidate predictor because it has been found to significantly correlate with neuroticism and conscientiousness (Rice & Van Arsdale, 2010), the two main hypothesized addictive personality components theoretically in addition to extraversion (Ibáñez, et al., 2008). To start with the exploration, the construct of perfectionism is first discussed below.

**Dimensions of Perfectionism**

Perfectionism is a personality trait that has been observed and studied extensively. One of the first and clearer definitions describes perfectionism as demanding of self or others a higher quality of performance than required by the situation (Hollender, 1978). Based on their literature review of the concept of perfectionism, Slaney and Ashby (1996) also pointed out that perfectionism mostly
involves excessively high personal standards (Slaney & Ashby, 1996). Researchers have found support to view perfectionism as a multidimensional construct (Flett & Hewitt, 2002; Frost, Marten, Lahart, & Rosenblate, 1990; Slaney, Rice, Mobley, Trippi, & Ashby, 2001).

**Maladaptive perfectionism and adaptive perfectionism**

Although perfectionism was proposed to encompass a number of dimensions, factor analyses and cluster analyses in the literature on perfectionism has generally shown two major dimensions: the adaptive or positive aspects of perfectionism versus the maladaptive or negative aspects of perfectionism (Frost, Heimberg, Holt, & Mattia, 1993; Rice, Ashby, & Slaney, 1998; Rice & Slaney, 2002; Slaney, Ashby, & Trippi, 1995). Slaney, Rice, and Ashby (2002) proposed that a dimension referred to as “discrepancy”, “the perception that one consistently fails to meet the high standards one has set of oneself (p. 69),” distinguishes positive adaptive perfectionism and negative maladaptive perfectionism. With the additional dimension of discrepancy, Slaney and colleagues argued that people could be divided into three groups in terms of perfectionism: adaptive perfectionists who have high personal standards and low discrepancy, maladaptive perfectionists who have high personal standards and high discrepancy, and non-perfectionists who have low personal standards regardless of discrepancy level.

Although adaptive perfectionism has been usually related to positive functioning indicators such as good affect regulation and coping, high self-esteem, and good interpersonal adjustment, maladaptive perfectionism has been linked to many negative indicators of neuroticism and problematic coping styles, such as self-criticism, more perceived stress, anxiety, emotional dysregulation, and depression (Aldea & Rice, 2006;
Dunkley, Zuroff, & Blankstein, 2003; Grzegorek, Slaney, Franze, & Rice, 2004; Mobley, Slaney, & Rice, 2005; Slaney, Pincus, Ulaszek, & Wang, 2006). Although perfectionism in general has been found to significantly correlate with the higher-order personality factors such as neuroticism and conscientiousness, the moderate-sized correlations suggest that perfectionism is a distinct personality construct (Enns & Cox, 2002). In addition, perfectionism was also found to further explain variance that could not be explained by these higher-ordered personality dimensions when they were used to predict outcome variables such as self-esteem (Rice, Ashby, & Slaney, 2007).

Perfectionism as a lower-order personality factor especially may be related to addiction because its related higher-order factors, neuroticism and conscientiousness, are also traits conceptually and theoretically related to some of proposed addictive personality traits such as negative emotionality, impulsivity or disinhibition (Ibáñez, et al., 2008). Therefore, perfectionism compared to other lower-ordered personality factors seems especially a good candidate that may relate to Internet addiction.

**Procrastination as one dimension of perfectionism**

It should be noted that procrastination has been proposed as one of the dimensions of perfectionism. In their attempt to develop a theoretically based scale to measure perfectionism, Johnson and Slaney (1996), included items regarding procrastination because perfectionists usually experience procrastination. However, their findings regarding the procrastination subscale’s relationship with perfectionism were mixed and inconclusive, thus the procrastination subscale was subsequently dropped. Hypothesis linking procrastination to perfectionism infers that procrastinating allows the individual to avoid less than perfect performance. Previous findings suggested that procrastination is positively related to the maladaptive aspects of
perfectionism but negatively associated with the adaptive characteristics of perfectionism (Frost et al., 1990). Procrastination has been linked to Internet addiction. For example, in Davis, Flett, & Besser’s (2002b) study, the traits of procrastination and decreased impulse control together appeared to predict Internet addiction. Because procrastination is a factor that is closely related to the construct of perfectionism, it could be interesting to explore it as a lower-order personality factor to Internet addiction as well. Because the main focus of this study is perfectionism, the relationship between procrastination and Internet addiction will only be examined explanatorily in the present study.

**Perfectionism and Substance Abuse Addiction**

Currently, there is essentially only one published articles examining the relationship between perfectionism and Internet addiction. In addition, there are only a few studies that have examined the link between perfectionism and substance abuse addiction. In an early attempt to find personality types of alcoholics, destructive drinking was found to occur among psychiatric patients with the obsessive perfectionist trait (Nerviano & Gross, 1983). In Hewitt and Flett’s (1991) study examining the relationships between psychopathologies and different types of perfectionism, alcohol abuse was significantly and positively correlated with self-oriented perfectionism and socially prescribed perfectionism. However, it should be noted that its significant positive correlation with self-oriented perfectionism was actually only demonstrated in men, whereas the significant positive correlation with socially prescribed perfectionism happened only among women. Self-oriented perfectionism and drug abuse was also significantly and positively related among men. Other-oriented perfectionism was significantly and positively related to drug abuse in general.
However, Flett and colleagues’ (2008) recent study about perfectionism and binge drinking among college students, only self-oriented perfectionism was found to be negatively correlated with binge drinking. In Pritchard, Wilson, and Yamnitz’s (2007) study on undergraduate college students’ drinking, perfectionism was also negatively associated with frequency of drinking. These inconsistent findings could be due to the lack of differentiation between adaptive perfectionism and maladaptive perfectionism. In a study investigating whether perfectionist college students drink alcohol to cope, it was found that adaptive perfectionists had less likelihood of drinking to cope, and fewer alcohol-related problems. On the other hand, maladaptive perfectionists appeared to have a significantly more elevated risk of drinking to cope, but reported no more alcohol-related problems than non-perfectionists (Rice & Van Arsdale, 2010). This finding seems to confirm that different dimensions of perfectionism may relate to addiction differently and maladaptive perfectionism might especially contribute to one’s addictive behaviors.

Perfectionism and Behavioral Addiction

As for the link between perfectionism and behavioral addiction, there have been preliminary studies that focus on computer game addiction, which is more similar to Internet addiction than other kinds of behavioral addiction. In a study examining personality characteristics and computer game addiction among 471 college students in Beijing, China, Shi et al. (2007) used the Sixteen Personality Factor Questionnaire to explore which personality factors were significantly related to computer game addiction. The results indicated that perfectionism was significantly and negatively related to game addiction ($r = -0.21, p < 0.01$). Another related construct, rule-consciousness, was also significantly and negatively related to game addiction ($r = -0.20, p < 0.01$). Other
personality factors that were also significantly related to game addiction were tension ($r = 0.21, p < 0.01$), vigilance ($r = 0.20, p < 0.01$), emotional stability ($r = -0.19, p < 0.01$), warmth ($r = -0.18, p < 0.01$), dominance ($r = 0.13, p < 0.01$), and apprehension ($r = 0.12, p < 0.05$). These findings seem to be in line with the previous findings on substance abuse addiction, which found that self-oriented perfectionism was negatively associated with binge drinking (Flett et al., 2008). Although the effect sizes of these relationships were considered small (J. Cohen, 1992), perfectionism and the related rule-consciousness, compared to other personality factors examined, had relatively larger effect.

Flett, Hewitt, Blankstein, and Dynin (1994) examined Type A personality, a similar construct to perfectionism, and its relationship with game addiction. Theoretically, Type A personality and perfectionism seem to be related constructs and various Type A behavior components were found to be significantly associated with perfectionism dimensions. This experimental study examined the arousal of computer game playing among 24 undergraduate students. The results indicated that subjects with Type A personality experienced significantly more arousal through increased heart rate when playing computer games than subjects with Type B personality. Griffiths and Dancaster (1995) suggested that Type A individuals might develop behavioral addiction more easily because they experience more arousal from playing computer games.

**Perfectionism and Internet Addiction among College Students**

There is only one recent study exploring the relationship between the relationship between perfectionism and Internet addiction among college students. Lehmann and Konstam (2011) examined how perfectionism and problematic Internet use might contribute to career indecision among 486 college-educated adults between the ages of
25 and 30 years old. The results indicated that problematic Internet use was substantially correlated with maladaptive perfectionism \((r = .49, p < .001)\), but it was not significantly related to adaptive perfectionism. This finding confirmed that perfectionism is an important personality trait that may relate to Internet addiction and maladaptive perfectionism specifically seems a strong predictor for Internet addiction among college students.

**Current Study**

One of the merits of the Stress Response Dampening Model is that it links the relationship between stress and addictions to personality factors. With this more comprehensive view of the three domains, researchers might have a better chance to reveal the complicated development of addictive behaviors. A recent study on college students’ alcoholism examined the three domains mentioned above, without specifically quoting the Stress Response Dampening Model (Rice & Van Arsdale, 2010). Focusing on the lower-ordered personality factor, perfectionism, this study’s main findings revealed that adaptive perfectionists had lower reported stress, lower rates of using drinking as the way to cope, and lower rates of alcohol-related problems than maladaptive perfectionists, and non-perfectionists. Maladaptive perfectionists had highest reported stress and drinking to cope although they showed about the same level of alcohol-related problems as non-perfectionists. Based on the framework of the Stress Response Dampening Model, the results would support that maladaptive perfectionists would be the most likely group to use alcohol to cope with stress compared to adaptive perfectionists and non-perfectionists. This result also highlighted that the all three domains: personality factors, stress, and addictive behaviors, interact with each other.
Although there has been some research on the psychological and personality correlates of Internet addiction during the last decade, there has not been much research directly addressing the contribution of stress to Internet addiction development among college students (Li et al., 2009). Among the limited studies on stress coping and Internet addiction, the interaction between pre-dispositional personality factors and stress factors has yet to be explored. Therefore, the goal of the current study is to explore how perceived stress together with certain specific personality factors, such as perfectionism and procrastination, or other relevant personality factors may contribute to Internet addiction among college students. Based on the literature review above, the research questions of the current study are:

1) What are the demographic characteristics and the prevalence rate of Internet addiction among college students?

2) Does perceived stress contribute to increased Internet addiction?

3) Which of the Big Five personality dimensions are related to Internet addiction?

4) How do different dimensions of perfectionism associate with Internet addiction?

5) How do maladaptive perfectionism and perceived stress interact to contribute to the development of Internet addiction?

For the above research questions, the hypotheses based on the literature reviewed are:

**Question 1**: The overall prevalence rate of Internet addiction among the college population could be over 10% (Niemz et al., 2005). Compared to non-Internet addicted college students, Internet addicted college students would be mostly male (Scherer, 1997), and they would have had significantly more years of experience using Internet (Kubey et al., 2001; Lin & Tsai, 2002).
Question 2: Perceived stress would be positively correlated with Internet addiction. Lavoie and Pychyl (2001) found that Internet procrastination was positively correlated with perceiving the Internet as a relief from stress ($r = .57, p < .0001$). Because the researchers suggested that Internet procrastination could be a kind of Internet addiction, it is expected that perceived stress would also be positively correlated with Internet addiction.

Question 3: Internet addiction would be negatively related to conscientiousness and positively related to extraversion and neuroticism. Theorists have suggested that impulsivity or disinhibition (e.g., sensation-seeking), extraversion or positive emotionality, and neuroticism or negative emotionality can potentially predispose people to develop addiction (Ibáñez et al., 2008).

Question 4: Internet addiction would be associated with maladaptive perfectionism but not adaptive perfectionism. As Lehmann & Konstam (2011) found, problematic Internet use was significantly correlated with maladaptive perfectionism ($r = .49, p < .001$) but it was not significantly related to adaptive perfectionism in their pilot study. Therefore, the same pattern of relationships between different types of perfectionism and Internet addiction can be expected.

Question 5: Perfectionism would moderate the relationship between stress and Internet addiction. The SRD model suggests that certain personality traits may moderate the relationship between stress and drinking. And Rice and Van Arsdale’s (2010) study pointed out that maladaptive perfectionism seemed to be the key personality trait that moderated the paths from perceived stress to alcohol-related
problems. Therefore, it would be expected that maladaptive perfectionism may moderate the relationship between perceived stress and Internet addiction.
CHAPTER 2
METHODS

Participants

This study focused on studying undergraduate college students’ Internet addiction because they are the most susceptible group (Young, 2007). Two sources were used to recruit participants. All participants were undergraduate students at the University of Florida (UF). First, participants were recruited from the UF psychology participant pool which is composed of mostly first or second year college students from various majors. Second, participants were recruited from various classes by email requests sent to instructors.

A total of 1793 entries were recorded on the survey website. One hundred and seventeen (6.5%) of the 1793 entries did not finish the survey, meaning at least one of the measures were completely unanswered, and 188 entries (10.5%) did not answer both of the two quality testing items correctly. Eight entries were recognized as duplicated because they had the exact same demographic information and the exact same IP address. Two participants were under 18 year old, another is an auditor, and 12 others were graduate students. Therefore, these 328 entries were excluded from the data analysis.

Among these remaining 1465 participants, 0.1% were American Indian or Alaskan Native, 9.4% were Asian, 7.4% were Black or African American, 15.3% were Hispanic, Latino(a), and/or of Spanish origin, 0.3% were Native Hawaiian or Other Pacific Islander, 61.4% were White, 4.4% were Bi-racial or Multi-racial, 1.5% were other race/ethnicity, and 0.2% did not report their race/ethnicity. According to UF undergraduate student enrollment facts for Fall 2010 (University of Florida, Office of
Institutional Planning and Research. 2011), there are 9.4% of Asian students, 10.0% of Black/African American students, 16.8% of Latino (a) students, 0.7% of Native American students, 59.5% of White/Caucasian students, 2.7% of not reported race and ethnicity, and 0.9% with non-resident alien status that could be of any above mentioned race and ethnicity categories. Compared to the information above, the racial/ethnicity composition of the sample is roughly similar to the current UF undergraduate student populations although there were slightly fewer participants who were Black or African American but more Bi-racial or Multi-racial participants in the current sample.

In terms of gender, 66.6% of the participants were female and 33.0% were male. Two participants identified themselves as transgender; two participants indicated their gender as other but did not specify; and two other participants declined to answer on this item. According to UF student enrollment facts for fall 2010 (University of Florida, Office of Institutional Planning and Research. 2011), there are 55.1% of female students and 44.9% of male undergraduate students at UF. Compared to the UF undergraduate student population, there were more female participants in this sample. There were 23.3% of the participants in their freshman year, 12.2% in their sophomore year, 34.7% in their junior year, and 29.4% in their senior year; five participants specified their academic classification as other, and one participant did not specify the academic status. According to UF student enrollment facts for fall 2010 (University of Florida, Office of Institutional Planning and Research. 2011), there were 12.4% of freshmen, 20.3% of sophomores, 29.7% of juniors, and 37.6% of seniors. Compared to the UF undergraduate student population, there were more freshmen and juniors but fewer
sophomores and seniors in our sample. These statistics with comparable UF demographic data are presented in Table 2-1.

In addition, other demographic information of this sample without comparable UF data is described below. Regarding sexual orientation, 1.6% described their sexual orientation as bisexual, 93.7% as heterosexual, 2.0% as homosexual, 0.5% said they were unsure about their sexual orientation, 0.3% described their sexual orientation as other, 1.7% decline to answer their sexual orientation, and two participants did not answer this question. There were 29.7% of the participants lived on campus, 70.3% of them lived off-campus, and four participants did not specify their residence. The mean age of the sample was 20.71 years (SD = 4.03), with the range from 18 to 56.

Measures

Demographic Questionnaire

The participants were asked to complete a demographic questionnaire at the end of the survey, including questions regarding participants’ age, year in college, major, GPA, gender, sexual orientation, race/ethnicity, living situation, and Internet usage. A copy of the demographic questionnaire is located in Appendix A.

The Internet Addiction Scale (IAS)

Participants’ Internet addiction level was measured by the Internet Addiction Scale (IAS, Nichols & Nicki, 2004). The IAS was developed by adapting seven criteria for substance dependence on the DSM-IV and two additional criteria including salience and mood modification suggested by Griffiths (1996a). The IAS contains 31 items in which response options are in a five-point Likert scale ranging from 1 (never), 2 (rarely), 3 (sometimes), 4 (frequently), to 5 (always). Higher scores represent a more serious degree of Internet addiction and the total score greater than the suggested cut-off score
of 93 (3X31 items) would indicate possible Internet addiction. In the test-norm sample of 207 undergraduate students in the United States, factor analyses of IAS revealed a one-factor model pertaining to negative consequences of excessive Internet use and demonstrated high internal consistency reliability; Cronbach’s coefficient alpha = .95. As for validity, the IAS also showed good content validity by using DSM-IV and theoretically reviewed criteria. It also demonstrated good construct validity among the norming undergraduate college students because the theoretically related constructs such as family loneliness, social loneliness, and boredom proneness were found to be significantly related to the IAS scores (Nichols & Nicki, 2004). A copy of the IAS is located in Appendix B.

**The Perceived Stress Scale (PSS)**

Participants’ stress level was measured by the Perceived Stress Scales (PSS, S. Cohen, Kamarck, & Mermelstein, 1983). The PSS contains 14 items in 5-point Likert scale format with response options from never (0) to very often (5). Higher scores on the PSS represent more perceived stress during the past month. The PSS’ internal consistency reliability for the initial two independent college samples were high (Cronbach’s alpha = .84 and .85 respectively). It also demonstrated good test-retest reliability with another college student sample \( r = .84 \) at two-day and six-week periods. The PSS showed good construct validity with its significant associations with negative life events and also demonstrated good criterion related validity with its significant correlations with depressive and physical symptoms among the norm college student samples. With a sample of 2387 participants with ages over 18 in a phone interview study, principal component factor analysis revealed two potential factors that together accounted for 41.6% of variance. However, the researchers concluded that the
distinction between the two factors is irrelevant for the purpose of measuring the perceived stress; therefore, a total score summing all 14 items was suggested to represent the construct in the analysis (S. Cohen & Williamson, 1988). In addition, S. Cohen and Williamson suggested using the ten-item version of PSS (PSS10) because it has slightly tighter factor structure and slightly better internal reliability while still providing an adequate measure of perceived stress. Therefore, the total of PSS10 will be used in the analysis. A copy of the PSS is located in Appendix C.

**The Mini International Personality Item Pool (Mini-IPIP)**

Participants’ personality characteristics were assessed by the Mini International Personality Item Pool (Mini-IPIP, Donnellan, Oswald, Baird, & Lucas, 2006). The Mini-IPIP is a 20-item short form of the 50-item International Personality Item Pool – Five Factor Model (IPIP-FFM) measure (Goldberg, 1999). The Mini-IPIP has four items per Big Five trait and similar coverage of each trait as other broad Big Five personality measures. The subscales of Mini-IPIP are Intellect/Imagination (openness), Conscientiousness, Extraversion, Agreeableness, and Neuroticism. Respondents were asked to describe themselves in current state and relative to people with the same demographic background using the statement in each item. The response options for each item range from very inaccurate, moderately inaccurate, neither accurate nor inaccurate, moderately accurate, to very accurate. The scoring of each item is based on the five-point-Likert-scale ranging from 1 to 5. Each subscale’s score ranges from 4 to 20 and high score represents higher degree of the corresponding Big Five trait.

The Mini-IPIP was developed and validated across five studies and showed reasonable reliability and validity with its reduced length (Donnellan, Oswald, Baird, & Lucas, 2006). In the norm sample of 2663 freshman undergraduate students, the
reliability of the five subscales in terms of Cronbach’s coefficients ranged from .65 for Intellect/Imagination to .77 for Extraversion. Discriminant validity with this sample was also evident with smaller average absolute scale inter-correlation ($r = .13$ and $r = .18$) for the Mini-IPIP compared to the original IPIP-FFM. In a sample of 329 undergraduate students, the Mini-IPIP also showed good reliability coefficients ranging from .70 for Intellect/Imagination to .82 for Extraversion. The Mini-IPIP also demonstrated reasonable content and convergent validity with similar and high correlations with other Big Five personality scales such as IPIP-FFM and Ten-Item Personality Inventory (TIPI). In another sample of 300 undergraduate students, the Mini-IPIP once again showed reasonable reliability coefficients from .70 for Intellect/Imagination to .82 for extraversion. In addition, it demonstrated good convergent validity with its similar and high correlation with IPIP-FFM and the Big Five Inventory (BFI); it also showed good criterion related validity with its similar correlation patterns compared to other Big Five measures using the three criteria of self-esteem, behavioral approach, and behavioral avoidance. In the fourth test validation study with 216 undergraduate students, the Mini-IPIP showed acceptable test-retest reliability of a three-week period on subscales that ranged from .62 for Agreeableness to .87 for Extraversion. In addition, it also had similar correlation patterns as with psychopathology related variables like IPIP-FFM, implying good criterion-related validity for criteria such as anxiety, depression, hostility/aggression, and psychological entitlement. In the last test validation study with 148 undergraduate students, the Mini-IPIP showed reasonable test-retest reliability with a six-to-nine-month period for subscales that had coefficients ranging from .68 for agreeableness to .86 for extraversion. It also showed similar correlations with criteria
such as positive affect, negative affect, and life satisfaction as IPIP-FFM did, which indicated good criterion-related validity for these variables. A copy of the Mini-IPIP is located in Appendix D.

**The Almost Perfect Scale-Revised (APS-R)**

Participants’ perfectionism level was measure by the Almost Perfect Scale-Revised (APS-R, Slaney et al., 2001). It contains 23 Likert-scale items with response options that range from strongly disagree (1) to strongly agree (7). Different dimensions of perfectionism are indicated with its three subscales: 1) Standards (7 items), assessing one’s high expectation for personal performance and achievement, 2) Discrepancy (12 items), tapping the negative/maladaptive aspect of perfectionism and representing “the perception that one consistently fails to meet the high standards one has set for oneself” (p. 69) (Slaney et al., 2002), and 3) Order (4 items), assessing one’s need for orderliness, neatness, and organization. Cronbach’s alphas of the subscales ranged from .82 to .92 for the norm sample of 809 undergraduate students, indicating good internal consistency reliability. In addition, the significant correlations of APS-R subscales and other perfectionism instruments’ subscales indicated good construct validity; APS-R subscales when compared to other perfectionism instruments’ subscales also demonstrated good criterion-related validity in terms of adjustment and well-being indexes such as achievement, self-esteem, depression, and anxiety. Whereas the Discrepancy subscale of APS-R seems to capture a maladaptive or negative aspect of perfectionism, Standards and Order subscales of APS-R seem to measure more positive and adaptive aspects of perfectionism (Slaney et al., 2001). However, based on Stoeber and Otto’s (2006) review, the Order subscale may be discarded when conceptualizing or differentiating between adaptive perfectionism and
maladaptive perfectionism. Therefore, only the subscales, Standards and Discrepancy would be used in the analyses to distinguish adaptive perfectionism and maladaptive perfectionism. A copy of the APS-R is located in Appendix E.

**The Tuckman Procrastination Scale (TPS)**

Participants’ procrastination tendency was measured by the Tuckman Procrastination Scale (TPS, Tuckman, 1991). This self-report scale contains 16 items to measure “the tendency to waste time, delay, and intentionally put off something that should be done” (Tuckman, 1991, p. 479). The response options are based on a four-point Likert scale without the option of a neutral point, ranging from 1 = That’s not me for sure to 4 = That’s me for sure. The possible score range from 16 to 64 and high scores indicate a higher degree of procrastination. The Cronbach’s alpha reliability coefficient of .86 was reported in the initial scale development study on 183 college students in the teach education program. Its construct validity was demonstrated by a correlation of -.54 between scores on the scale and scores on a voluntary task representing motivational tendency of self-regulation. Its concurrent validity on college students was shown through a correlation of -.47 between the scores on the scale and a self-efficacy scale (Tuckman, 1991). A copy of the TPS is located in Appendix F.

**The Impulsive Sensation Seeking Scale (ImpSS)**

Participants’ impulsivity and sensation seeking were measured by the Impulsive Sensation Seeking Scale (ImpSS, Zuckerman et al., 1993). ImpSS is a 19-item self-reported scale that measures one’s tendency of impulsivity and sensation seeking. The ImpSS is actually a subscale of the Zuckerman-Kuhlman Personality Questionnaire (ZKPQ; Zuckerman et al., 1993). Factor analysis revealed that the two factors, impulsivity and sensation seeking. Whereas the impulsivity subscale measures the
tendency to act impulsively without thinking or planning, the sensation seeking subscale measures one’s general need for thrills and excitement, preference for unpredictable situations and friends, and need for change and novelty. The advantage of this instrument is that it has no mention of specific activities like drinking, drug use, sex, or risky sports so that it can be applied to most people. Based on a sample of 2969 college students (Zuckerman et al., 1993), reliability Cronbach’s alphas for the sensation seeking subscale were .77 among females, and .74 among males; the reliability Cronbach’s alphas for impulsivity were .68 for females and .64 for males. A copy of the ImpSS is located in Appendix G.

**Quality Testing Items**

Two quality testing items were included to check whether the participants’ responses are valid. The first quality testing item was worded, “This is a quality testing question; please choose “Sometimes” as the answer.” It was located in the IAS as item 23. The second quality testing item was worded, “This is a quality testing question; please choose “Strongly Agree” as the answer.” It was located in the APS-R as item 18. If participants failed to answer both of the quality items correctly, their responses were excluded from my analyses.

**Procedure**

Purposive sampling was conducted to recruit UF students to take the survey. An online survey development program, Qualtrics, was used to develop the online study. For participants from various courses, an IRB-approved invitation letter was sent out to professors and graduate student instructors. The professors and instructors were asked to forward the email in the class listservs and also make an announcement in class about participating in the study. The professors and instructors individually decided
whether to provide students extra credit and an alternative extra credit opportunity or not. Participating students then took the online survey by clicking the link in the email. Participants from the psychology participant pool took the survey by clicking the link in the study description posted on the SONA system.

The first page of the online survey was the IRB proved informed consent. At the end of that page, there is a description saying, “By clicking the “Start the Survey” button below, you give your consent to participate in this study on your will.” The digital consent was recorded as students click that button which led them to the actual survey. All participants filled out the demographic information in the end of the survey. However, participants might have taken the measures in this study in different orders because Qualtrics randomized the sequence of the measures so that the results were not affected by a specific sequence of the measures. After participants completed the survey, they were redirected to a page that showed the link of another survey that recorded their course information (for participants from the courses) so that students would get participation credits or extra credit provided by their professors and instructors. Because this survey was separated from the study survey, the information they provided was not linked to the answers they provided in the actual survey.
Table 2-1. Participant demographics compared to UF student population Fall 2010.

<table>
<thead>
<tr>
<th>Variable</th>
<th>UF #</th>
<th>UF %</th>
<th>Sample #</th>
<th>Sample %</th>
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<td>.1</td>
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<td>138</td>
<td>9.4</td>
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<td>430</td>
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</tr>
</tbody>
</table>
CHAPTER 3
RESULTS

Preliminary Analyses

A total of 1793 survey entries were recorded, but the preliminary analyses were run on 1465 participants after excluding duplicate entries, participants who did not answer the quality testing items correctly and complete the survey successfully, participants who were under 18, and participants who were auditors or graduate students.

Normality Assumption

The normality assumption of the variables was checked. According to Field (2000, p. 72), large samples with 200 participants or more usually result in smaller standard errors and significant values arise from even small deviations from normality. Therefore, it is more important to check the shape of distribution and the actual skewness and kurtosis statistics than judging based on the significance level. Based on the skewness and kurtosis Z scores (over 3.29, p < .001), Intellect/Imagination, Conscientiousness, Agreeableness, APS-R-Standards (APS-R-S) and Sensation Seeking (SS) appeared somewhat negatively skewed; Internet addiction (IAS), perceived stress (PSS10), APS-R-Discrepancy (APS-R-D), and Impulsivity (Imp) appeared somewhat positively skewed. All of the variables’ Kolmogorov-Smirnov tests for normality were significant (p < .05) but the normal Q-Q plots and detrended normal Q-Q plots were acceptable. Judging from the histograms, only Intellect/Imagination, Conscientiousness, Agreeableness, APS-R-S, IAS, APS-R-D, and Imp showed some noticeable non-normality in distribution but the shapes of PSS10 and SS appeared roughly normal.
There were some outliers detected for IAS, PSS, Intellect/Imagination, Conscientiousness, Agreeableness, APS-R-Standards, and TPS. However, as Table 3-1 indicates, there were not much differences between all variables’ Means and 5% Trimmed Means (the means after deleting the 5% outliers), and the differences were all well below one standard deviation. Because the outliers did not seem to alter the means much, they were all kept in the analyses. Overall, based on the various criteria discussed above, PSS, Mini-IPIP-Extraversion, Neuroticism, TPS, and SS seemed roughly normally distributed, but Intellect/Imagination, Conscientiousness, Agreeableness, and APS-R-Standards, were negatively skewed; and IAS, APS-R-D, and Imp were positively skewed.

To address the non-normality of Intellect/Imagination, Conscientiousness, Agreeableness, APS-R-S, IAS, APS-R-D, and Imp, I transformed these variables with square root transformation and necessary reflect procedures suggested by Tabachnick and Fidell (2006, p.92). After transformation, only the transformed APS-R-S (t-APS-R-S) still appeared somewhat negatively skewed although it was much improved from the original APS-R-S. Logarithm and inverse transformations were also tested on APS-R-S but they did not derive better skewness and kurtosis numbers. The most deviant skewness value of the variables in analysis after transformation is -.32 (t-APS-R-S) and the most deviant kurtosis value (t-Imp) is -1.25. Table 3-1 shows the skewness and kurtosis values of all the variables including the transformed variables. These actual skewness and kurtosis statistics seem acceptable for this large sample size. Tabachnick and Fidell (p. 80) indicated that deviation of skewness and kurtosis in large samples would not make substantial differences in analysis as long as the absolute
skewness and kurtosis values are not far away from zero. Kline (2005) also indicated that only absolute values of kurtosis higher than 10 would suggest a problem for univariate normality. The transformed variables all had highly significant positive correlations with their corresponding original variables as indicated in Table 3-2.

**Reliability of Variables in the Analyses**

Score reliabilities (Cronbach’s coefficient alphas) were satisfactory and ranged from .72 to .95 for this sample. The specific values of Cronbach’s coefficient alphas for all the scales are also shown in Table 3-1.

**Prevalence of Internet Addiction among College Students**

The prevalence rate and demographic characteristics of Internet addiction were also examined. Using the cutoff score of 93 suggested (Nichols & Nicki, 2004), the prevalence rate of Internet addiction in this sample is 10.4%.

**Regression Assumption**

Related demographic variables would be controlled in the main regression analyses. According to previous studies, demographic variables including gender, age, and years of Internet use would be related to Internet addiction. Therefore, the relationships between t-IAS and these demographic variables were examined. Regarding gender, due to the small sample sizes of the categories for transgender, other, and decline to answer (two participants for each category), these six participants would not be included in the analyses because statistical analyses with such small sample sizes may not be reliable. An independent-samples t-test was conducted to compare the t-IAS scores for males and females among the remaining 1459 participants. There was no significant difference in t-IAS scores for females \( M = 8.16, SD = 1.17 \) and males \( M = 8.16, SD = 1.18; t(1457) = -.04, p = .97 \). The magnitude of
the differences in the means was very small (eta squared < .001). Another bivariate correlation analysis was run to explore how age and years of Internet use correlated with t-IAS. It turned out that t-IAS was significantly and negatively related to age ($r = -0.15$, $p < .0005$) but not to years of Internet use ($r = -0.05$, $p > .05$). Therefore, only age would be controlled in the regression analyses.

To examine multivariate outliers, a multiple regression model was run by entering age and all the main variables including PPS10, t-Intellect/Imagination, t-Conscientiousness, Extraversion, t-Agreeableness, Neuroticism, APS-R-S, APS-R-D, TPS, Imp, and SS as independent variables and t-IAS as the dependent variable. Regression diagnostics revealed no significant concerns regarding multicollinearity because none of the Tolerance values were below .10. In addition, the bivariate correlations between all entered demographic variables were all lower than .70 (Tabachnick & Fidell, 2006, p. 90). Examination of the normal probability plot of the standardized residuals did not show signs of violation for normality. Examination of the scatter plot of the standardized residuals also did not show signs of violation for linearity or homoscedasticity. In terms of standardized residual values, there was only four outlier identified that exceeded three standard deviations. In terms of Cook’s Distance, none of the values exceeded 1. In terms of Mahalanobis distance values, there were 26 cases whose values exceeded the critical value for 13 independent variables, 32.91 ($df = 12, p < .001$); these multivariate outliers were deleted and only the remaining 1429 cases were included in the hierarchical multiple regression analyses.

**Stress and Internet Addiction**

A bivariate correlation analysis was conducted to test the hypothesis whether perceived stress (PSS10) in the past month would be associated with Internet addiction
(t-IAS). I chose the two-tailed test of significance for this bivariate correlation because a directional hypothesis could not be clearly supported by previous literature. The result indicated that PSS10 was positively correlated with t-IAS ($r = .34, p < .0005$). The effect size is considered medium (J. Cohen, 1992).

**Big Five Personality Factors and Internet Addiction**

A hierarchical multiple regression analysis was run to examine how the Big Five personality factors relate to Internet addiction. Age was entered in the first block and the Mini-IPIP subscales (t-Intellect/Imagination, t-Conscientiousness, Extraversion, t-Agreeableness, and Neuroticism) were entered in the second block. T-IAS was the dependent variable. This overall regression model associating Internet addiction with the Big Five personality factors by age was significant ($R^2 = .15, F[6, 1418] = 42.26, p < .0005$). The first block result showed that age accounted for significant but small variation in t-IAS, $R^2 = .01, F(1, 1423) = 17.34, p < .0005$. The $R^2$ change of the added Big Five personality factors in the second block was significant ($\Delta R^2 = .14, p < .00005$) although the effect size of the Big Five factors was considered medium according to J. Cohen’s (1992) standard on $R^2$. Specifically, there was a significant positive effect of Neuroticism on t-IAS ($\beta = .19, t = 7.50, p < .0005$) and a significant negative effect of t-Conscientiousness on t-IAS ($\beta = -.27, t = -10.74, p < .0005$); and there were smaller negative effects of t-Extraversion ($\beta = -.09, t = -3.65, p < .0005$) and t-Intellect/Imagination ($\beta = -.07, t = -2.57, p < .05$) on t-IAS; but there were no significant effects of t-Agreeableness ($\beta = -.04, t = -1.61, p = .11$) on t-IAS in the second block of the equation. In summary, high neuroticism and lack of conscientiousness and, to some degree, lower extraversion and openness were associated with Internet addiction when controlling age.
Perfectionism and Internet Addiction

Hierarchical multiple regression was used to examine the effect of the APS-R subscales, Standards and Discrepancy and their interaction on Internet addiction. Following Aiken and West’s (1991) procedure for testing interaction effect, centered t-APS-R-S and t-APS-R-D were entered in the third block and their interaction term was entered in the fourth block based on the previous model. This overall regression model associating perfectionism subscales with Internet addiction by controlling age and the Big Five personality factors was significant ($R^2 = .22$, $F[9, 1415] = 45.22, p < .0005$). The first and second blocks with age and Big Five personality factors produced the same results as described in the section above. The $R^2$ change of the third block with centered t-APS-R-S and t-APS-R-D was significant, $F(2, 1416) = 60.71, p < .0005$. Standards and Discrepancy together accounted for an additional 7% of the variation in t-IAS although the effect size of the APS-R subscales was considered small to medium (J. Cohen, 1992). Specifically, there was a significant positive effect of centered t-APS-R-D on t-IAS ($\beta = .25, t = 9.49, p < .0005$) and there was a significant negative effect of centered t-APS-R-S on t-IAS ($\beta = -.14, t = -5.63, p < .0005$) in the third block of the equation.

Therefore, regarding the main effect, Discrepancy was positively related to Internet addiction and Standards was negatively associated to Internet addiction when controlling age and the Big Five personality factors.

In addition, the interaction term of centered t-APS-R-S multiplied by centered t-APS-R-D in the fourth block was also significant, $\Delta R^2 = .005, F(1, 1415) = 8.49, p < .005$ although the effect size is considered very small. Specifically, this interaction term had a significant negative effect on t-IAS ($\beta = -.07, t = -2.91, p < .005$). Table 3-3 shows the complete results in the final model. The interaction effect indicated that Discrepancy
moderated the negative relationship between Standards and Internet addiction. To illustrate the relationship clearly, I explored the significant interaction effect with the MODPROBE SPSS macro developed by Hayes and Matthes (2009). This macro helped generate the scores of the focal predictor (Standards) and the corresponding t-IAS scores by controlling age and the Big Five personality factors as covariates when the moderator (Discrepancy) was at low (-1 SD below its mean), average (mean), and high (+1 SD above its mean) values. At low level of Discrepancy, the effect of Standards on Internet addiction was not significant ($B = -.07$, $p > .05$), but it was significant at average and high levels of Discrepancy ($B = -.16$ and -.24, $p < .05$). This interaction effect was plotted based on the values generated by the MODPROBE macro. Figure 3-1 displays this effect. When Discrepancy was higher, the negative association between Standards and Internet addiction also became stronger. When Standards was low, the difference between high Discrepancy and low Discrepancy participants' t-IAS scores (1.17) was almost equal to one full standard deviation (1.18), which suggested a large effect size difference. This confirmed that the moderating effect of Discrepancy on the relationship between Standards and Internet addiction was valid although the effect was small.

**Moderating effect of Perfectionism on the Relationship between Perceived Stress and Internet Addiction**

A hierarchical multiple regression analysis was conducted to test whether perfectionism (t-APS-R-S and t-APS-R-D) would moderate the relationship between perceived stress (PPS10) and Internet addiction (t-IAS). To deal with the collinearity problem of the interaction product term in the regression, every entered independent variable was centered from their mean (Aiken & West, 1991). In this hierarchical multiple regression analysis testing the moderating effect of perfectionism, centered t-
PSS10, centered t-APS-R-S, and centered t-APS-R-D along with age were entered in
the first block while their two-way centered product terms (PSS10 X t-APS-R-S, PSS10
X t-APS-R-D, and t-APS-R-S X t-APS-R-D) were entered in the second block and their
three way product term (PSS10 X t-APS-R-S X t-APS-R-D) was entered in the third
block. The t-IAS served as the dependent variable.

Results indicated a lack of significant moderating effects of t-APS-R-S and t-APS-
R-D on the relationship between PSS10 and t-IAS. The first block of results showed that
the regression model with centered t PSS, t-APS-R-D, and t APS-R-D along with age as
was significant, \( F(4, 1420) = 91.71, p < .0005 \). A combination of centered PSS10,
centered t-APS-R-D, and t-APS-R-D and age accounted for 20.5% of the variance of t-
IAS. The second block results showed that adding the additional products of centered
terms including PSS10 X t-APS-R-S, PSS10 X t-APS-R-D, and t-APS-R-S and t-APS-
R-D altogether was significant. However, there was only additional .005 of effect size
change in \( R^2 \) in the second block, \( F(3, 1417) = 3.19, p < .05 \). Specifically, the products
of centered terms, PSS10 X t-APS-R-S and PSS10 X t-APS-R-D, were not significant
but the product of centered t-APS-R-S and t-APS-R-D was significant \( (\beta = -.08, t = -2.81,\n\ p < .01) \). The results indicated that Standards and Discrepancy did not moderate the
relationship between perceived stress and Internet addiction; however, Discrepancy did
show a moderating effect on the relationship between Standards and Internet addiction
that is similar to the one presented in the previous analysis. The third block results
showed that the additional three-way interaction term of PSS10 X t-APS-R-S X t-APS-
R-D was not significant. There was no change in \( R^2, F(1, 1416) = .07, p > .05 \). This
result indicated that Standards, Discrepancy, and perceived stress did not interact
altogether in the relationship between perceived stress and Internet addiction. Table 3-4 displays the complete results in the final model.

The significant interaction effect of centered t-APS-R-S and t-APS-R-D on t-IAS was also further explored with the MODPROBE SPSS macro by Hayes and Matthes (2009). By controlling the covariates including age, the centered PSS10, APS-R-S, APSR-D, the two way interaction centered terms, PSS X APS-R-S and PSS X APS-R-D, and the three-way interaction centered term PSS X APS-R-S X APS-R-D, the MODPROBE macro generated the scores of the focal predictor (Standards) and the corresponding t-IAS scores when the moderator (Discrepancy) was at low (-1 SD below its mean), average (mean), and high (+1 SD above its mean) values. At low, average and high level of Discrepancy, the effects of Standards on t-IAS were all significant (B = -.12, p < .05; B = -.21, p < .0005; B = -.31, p < .0005, respectively). Figure 3-2 displays this effect. When Discrepancy was higher, the negative association Standards between Standards and Internet addiction also became stronger. When Standards was low, the difference between high Discrepancy and low Discrepancy participants’ t-IAS scores (1.21) was more than one full standard deviation (1.18), which suggested a large effect size difference. This once again confirmed that the moderating effect of Discrepancy on the relationship between Standards and Internet addiction was valid.

**Exploratory Analysis**

Other personality factors such as procrastination (TPS), sensation seeking (SS), and impulsivity (t-Imp) along with the Big Five personality factors (t-Intellect/Imagination, t-Conscientiousness, Extraversion, t-Agreeableness, and Neuroticism) were also examined in the exploratory analyses. First, the bivariate correlation analyses were conducted to examine the relationships between t-IAS and these personality variables.
All personality factors tested showed significant relationship with Internet addiction. However, except TPS, APS-R-D, t-Imp, and t-Conscientiousness, all the other personality variables' correlations with t-IAS exhibited small effect sizes. Among the variables with smaller effect sizes, neuroticism and sensation seeking had positively correlations whereas Intellect/Imagination (openness), Extraversion, t-Agreeableness, and APS-R-S had negative correlations with t-IAS. Conscientiousness and t-IAS were negatively correlated and t-Imp and t-IAS were positively related; their effect sizes are considered as medium according to Cohen’s (1992) standards for r. Especially, TPS was significantly related to t-IAS ($r = .48$, $p < .0005$). There was also a large effect size in terms of the relationship between t-APS-R-D and t-IAS ($r = .36$, $p < .0005$). The results imply that perfectionism-related constructs, specifically maladaptive perfectionism and procrastination, seem to serve as better predictors for Internet addiction than other personality factors. The correlations between t-IAS and all the personality factors are presented in Table 3-5.

Second, in addition to testing the moderating effect of perfectionism, all other personality factors included in this study were also tested for their moderating effects on the relationship between perceived stress and Internet addiction. Along with the demographic variable, age, each personality factor was centered from its mean (Aiken & West, 1991) and entered with centered PSS and their product terms in a hierarchical multiple regression model. The t-IAS served as the dependent variable. Among all the personality variables, procrastination did not seem to have a moderating effect as expected; only neuroticism appeared to moderate the relationship between perceived stress and Internet addiction. Specifically, in the hierarchical multiple regression
analysis examining the moderating effect of neuroticism, The first block of results showed that the regression model with centered t PSS and Neuroticism along age as independent variables was significant, $F(3, 1421) = 68.71, p < .0005$. A combination of centered t-PSS and Neuroticism and demographic factors accounted for 12.7% of the variance of t-IAS. The second block results showed that the additional interaction term of centered t PSS and Neuroticism was significant. There was only additional .006 change in $R^2$, $F(1, 1420) = 9.47, p < .005$. This effect size of the moderating effect of neuroticism was considered very small according to J. Cohen’s (1992) standard on $R^2$.

The significant interaction effect of centered perceived stress and neuroticism on t-IAS was also further explored with the MODPROBE SPSS macro by Hayes and Matthes (2009). By controlling the covariates including age, the MODPROBE macro generated the scores of the focal predictor (PSS10) and the corresponding t-IAS scores when the moderator (Neuroticism) was at low (-1 SD below its mean), average (mean), and high (+1 SD above its mean) values. At low, average and high level of Neuroticism, the effects of stress on t-IAS were all significant ($B = .07, .06, \text{ and } .05$ respectively, $p < .0005$). Figure 3-3 displays this effect. When Neuroticism was higher, the negative association Standards between Standards and Internet addiction also became weaker. However, when perceived stress was low, the difference between high Neuroticism and low Neuroticism participants’ t-IAS scores (0.55) was much less than the standard deviation of t-IAS (1.18), which indicated a small effect size difference. This result suggests that the very small significant $R^2$ change (.006) of the moderating effect found in the regression might have resulted from the excessive statistical power due to the
very large sample size rather than the actual moderating effect of Neuroticism on the relationship between perceived stress and Internet addiction.
## Table 3-1. Mean, 5% trimmed mean, and standard deviation, skewness, kurtosis and reliability of all variables.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>5% trimmed mean</th>
<th>Standard deviation</th>
<th>Skewness</th>
<th>Kurtosis</th>
<th>Cronbach’s coefficient α</th>
</tr>
</thead>
<tbody>
<tr>
<td>IAS</td>
<td>67.95</td>
<td>67.41</td>
<td>19.44</td>
<td>.37</td>
<td>-.34</td>
<td>.95</td>
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<td>t-IAS</td>
<td>8.16</td>
<td>8.15</td>
<td>1.18</td>
<td>.06</td>
<td>-.59</td>
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</tr>
<tr>
<td>PSS10</td>
<td>18.58</td>
<td>18.48</td>
<td>6.50</td>
<td>.21</td>
<td>-.07</td>
<td>.89</td>
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**Mini-IPIP**

<table>
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<tr>
<th>Variable</th>
<th>Mean</th>
<th>5% trimmed mean</th>
<th>Standard deviation</th>
<th>Skewness</th>
<th>Kurtosis</th>
<th>Cronbach’s coefficient α</th>
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</thead>
<tbody>
<tr>
<td>Intellect/Imagination</td>
<td>14.97</td>
<td>15.08</td>
<td>3.03</td>
<td>-.49</td>
<td>-.01</td>
<td>.73</td>
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<td>t-Intellect/Imagination</td>
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<td>2.74</td>
<td>.65</td>
<td>.21</td>
<td>-.27</td>
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<tr>
<td>Conscientiousness</td>
<td>14.55</td>
<td>14.65</td>
<td>3.34</td>
<td>-.41</td>
<td>-.43</td>
<td>.78</td>
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<tr>
<td>t-Conscientiousness</td>
<td>2.68</td>
<td>2.67</td>
<td>.69</td>
<td>.20</td>
<td>-.51</td>
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<tr>
<td>Extraversion</td>
<td>12.82</td>
<td>12.87</td>
<td>3.82</td>
<td>-.18</td>
<td>-.71</td>
<td>.83</td>
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<tr>
<td>Agreeableness</td>
<td>15.88</td>
<td>16.04</td>
<td>2.86</td>
<td>-.69</td>
<td>.53</td>
<td>.74</td>
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<tr>
<td>t-Agreeableness</td>
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<td>2.96</td>
<td>.65</td>
<td>.06</td>
<td>-.41</td>
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<tr>
<td>Neuroticism</td>
<td>10.99</td>
<td>10.95</td>
<td>3.40</td>
<td>.16</td>
<td>-.37</td>
<td>.72</td>
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**APS-R**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>5% trimmed mean</th>
<th>Standard deviation</th>
<th>Skewness</th>
<th>Kurtosis</th>
<th>Cronbach’s coefficient α</th>
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<tbody>
<tr>
<td>APS-R-S</td>
<td>42.75</td>
<td>43.25</td>
<td>5.52</td>
<td>-1.24</td>
<td>1.88</td>
<td>.87</td>
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<td>t-APS-R-S</td>
<td>4.34</td>
<td>4.38</td>
<td>1.01</td>
<td>-.32</td>
<td>-.40</td>
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<tr>
<td>APS-R-D</td>
<td>44.30</td>
<td>43.95</td>
<td>15.57</td>
<td>.35</td>
<td>-.50</td>
<td>.94</td>
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<tr>
<td>t-APS-R-D</td>
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<td>6.56</td>
<td>1.19</td>
<td>-.05</td>
<td>-.50</td>
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**ImpSS**

<table>
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<th>Variable</th>
<th>Mean</th>
<th>5% trimmed mean</th>
<th>Standard deviation</th>
<th>Skewness</th>
<th>Kurtosis</th>
<th>Cronbach’s coefficient α</th>
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<tbody>
<tr>
<td>Imp</td>
<td>1.86</td>
<td>1.70</td>
<td>1.92</td>
<td>.96</td>
<td>.03</td>
<td>.75</td>
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<tr>
<td>t-Imp</td>
<td>1.07</td>
<td>1.04</td>
<td>0.85</td>
<td>.01</td>
<td>-1.24</td>
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<tr>
<td>SS</td>
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<td>6.66</td>
<td>3.07</td>
<td>-.22</td>
<td>-.72</td>
<td>.78</td>
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<tr>
<td>TPS</td>
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<td>36.65</td>
<td>8.82</td>
<td>.16</td>
<td>-.09</td>
<td>.93</td>
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Note: Standard error of skewness for all variables was .06 and standard error of kurtosis for all variables was .13.
Table 3-2. Correlations between the transformed variables and the corresponding original variables.

<table>
<thead>
<tr>
<th>Variable pair</th>
<th>Pearson correlation</th>
<th>Significance (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>t-IAS and IAS</td>
<td>1.00</td>
<td>.00</td>
</tr>
<tr>
<td>t-Intellect/Imagination and Intellect/Imagination</td>
<td>.98</td>
<td>.00</td>
</tr>
<tr>
<td>t-Conscientiousness and Conscientiousness</td>
<td>.99</td>
<td>.00</td>
</tr>
<tr>
<td>t-Agreeableness and Agreeableness</td>
<td>.98</td>
<td>.00</td>
</tr>
<tr>
<td>t-APS-R-S and APS-R-S</td>
<td>.97</td>
<td>.00</td>
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<td>t-APS-R-D and APS-R-D</td>
<td>.99</td>
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<td>t-Imp and Imp</td>
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<td>.00</td>
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Table 3-3. Final model of the hierarchical regression analysis using age, the Big Five personality factors, perfectionism variables in predicting Internet addiction.

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>Std. error of B</th>
<th>Beta</th>
<th>t</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-.04</td>
<td>.01</td>
<td>-1.10</td>
<td>-4.22</td>
<td>.00</td>
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<tr>
<td>t-Intellect/Imagination</td>
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<td>.04</td>
<td>-1.18</td>
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<td>Extraversion</td>
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<td>t-Agreeableness</td>
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<tr>
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Table 3-4. Final model of the hierarchical regression analysis using age, perceived stress, perfectionism variables in predicting Internet addiction.

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>Std. error of B</th>
<th>Beta</th>
<th>t</th>
<th>Significance</th>
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<td>Centered t-APS-R-D</td>
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76
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<td>-0.29**</td>
<td>-0.14**</td>
<td>-0.08**</td>
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<td>-0.07**</td>
<td>0.12**</td>
<td>0.21**</td>
<td>-0.09**</td>
<td>0.06*</td>
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<td>0.18**</td>
<td>0.07*</td>
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<td>3. t-Conscientiousness</td>
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<td>0.03</td>
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<td>0.09**</td>
<td>-0.09**</td>
<td>0.30**</td>
<td>-0.23**</td>
<td>-0.17**</td>
<td>-0.37**</td>
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<td>4. Extraversion</td>
<td></td>
<td>0.23**</td>
<td>-0.10**</td>
<td>0.14**</td>
<td>-0.17**</td>
<td>0.34**</td>
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<td>5. t-Agreeableness</td>
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<td>0.04</td>
<td>0.21**</td>
<td>-0.14**</td>
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<td>6. Neuroticism</td>
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<td>7. t-APS-R-S</td>
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<td>-0.09**</td>
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<td>8. t-APS-R-D</td>
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<td>9. SS</td>
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<td>10. t-Imp</td>
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<td>0.34**</td>
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<td>11. TPS</td>
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Note. ** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).
Figure 3-1. Moderating effect of Discrepancy (t-APS-R-D) on the relationship between Standards (t-APS-R-S) and Internet addiction (t-IAS) controlling age, the Big Five personality variables (t-Intellect/Imagination, t-Conscientiousness, Extraversion, t-Agreeableness, and Neuroticism).
Figure 3-2. Moderating effect of Discrepancy (t-APS-R-D) on the relationship between Standards (t-APS-R-S) and Internet addiction (t-IAS) controlling age, perceived stress (PSS10), PSS X t-APS-R-D, PSS X t-APS-R-D, and PSS X t-APS-R-S X t-APS-R-D.
Figure 3-3. Moderating effect of Neuroticism on the relationship between perceived stress (PSS10) and Internet addiction (t-IAS).
CHAPTER 4
DISCUSSION

Specific findings from this study are further discussed in the context of the existing literature below. Especially, the stress-diathesis perspective and the Stress Response Dampening Model are used to explain findings regarding to the interaction of stress and personality factors.

**Prevalence and Demographic Variables**

The associations between Internet addiction and demographic factors in this sample showed some interesting results. First, this study found a higher prevalence rate of Internet addiction among college students. The possible reason could be that Internet is more accessible nowadays so that this generation of college students showed a much higher Internet addiction prevalence rate, 10.4%, compared to the only less than 1% prevalence rate found using the same Internet Addiction Scale (Nichols & Nicki, 2004). This finding of high prevalence rate is closer to the 18% Internet addiction prevalence rate found by Niemz, Griffiths, & Banyard (2005).

Gender did not appear to significantly relate to Internet addiction for this sample. This could be due to the fact that there were more female participants in this sample than the previous studies. Chou et al. (2005) pointed out that the studies that showed males more vulnerable to Internet addiction usually had more male participants in the sample. This result is in line with Chou and colleagues’ (2005) review that online studies with a diverse population usually revealed no gender differences.

Age was negatively related to the degree of Internet addiction in the bivariate correlation analyses. This result seems to be different from the previous cross-sectional study conducted by Bricolo et al. (2007) that found participants who were in their
adulthood used Internet more than the participants in their adolescence. My study result suggests that younger college students may experience more Internet addiction problem than the older college students. This finding fits the common thought that younger individuals might have less self-control or mature personality to curb Internet use. It could also be due to the fact that young college students may have more time or more exposure to the new functions of the Internet and therefore they become more addicted to the Internet. However, it should be noted that the relationship between age and Internet addiction had relatively small effect size. So readers should be careful about generalizing these results to other college students.

Surprisingly, years of Internet use was not related to Internet addiction. Previous studies suggested that Internet addiction is more prevalent among people with more years of Internet use (Kubey et al., 2001; Lin & Tsai, 2002). This could also be due to that Internet is more prevalent nowadays so that it eliminates the effect of difference of Internet use experience. Compared to ten years ago, Internet access and its functions are more closely intertwined with our daily life nowadays. Therefore, using Internet may not matter anymore because most participants in this sample probably started around the same early age. And people’s Internet use may be less variant with years of Internet use because Internet is so much accessible for all age groups nowadays. In the study conducted by Kubey and his colleagues, limited Internet access might have caused the lower reported incidence of Internet addiction for participants with fewer years of Internet use.

**Perceived Stress**

The bivariate correlation analysis revealed that stress was positively related to Internet addiction and the effect size was quite respectable. Although the association is
correlational in nature, previous research suggested that stress causes Internet addiction rather than the other way around because frequency of Internet use was two to four times more when participants experienced stress from work (Whang, Lee, & Chang, 2003) and various stressors seemed to contribute to the incident of Internet addiction (Li, Wang, & Wang, 2009). Other studies also suggested that Internet dependent people may use the Internet to release stress (Davis, Flett, & Besser, 2002a; Davis, Flett, & Besser, 2002b; Ferrari, Johnson, & McCown, 1995; McCown & Johnson, 1991). Some of the shortcomings of these previous studies were that stress was not measured by standardized instruments and that number of stressors or stressful events was used to represent perceived stressed. This study used the Perceived Stress Scale to avoid the above issues and the results provided a more quantifiable way to explain how stress experienced during the past month may contribute to one's current Internet use or Internet addiction.

The Big Five Personality Factors

Regarding the relationships between the Big Five personality factors and Internet addiction, the hierarchical multiple regression analysis revealed that these five higher-order personality traits together along with age, formed a significant model to predict Internet addiction. Specifically, conscientiousness actually showed a significant negative association with Internet addiction. This direct association between conscientiousness and Internet addiction has not been reported although a conscientiousness-related construct, sensation seeking, showed inconsistent relationship with Internet addiction (Chou et al., 2005). This result definitely calls for more studies about the relationship between conscientiousness on Internet addiction. This finding actually might not be so surprising considering that impulsivity or dis-inhibition (e.g., sensation-seeking), which is
conceptually opposite of conscientiousness, is one of the hypothesized addictive personality traits like neuroticism and extraversion (Ibáñez, Ruiperez, Villa, Moya, & Ortet, 2008).

Among the other Big Five personality factors, neuroticism was positively related to Internet addiction. This supports previous studies’ consistent finding of positive relationship between neuroticism and Internet addiction (Amichai-Hamburger & Ben-Artzi, 2003; Hamburger & Ben-Artzi, 2000; Wolfradt & Doll, 2001). Whereas the previous studies also found significant but inconsistent relationships between extraversion and Internet addiction, this study revealed a negative significant relationship between extraversion and Internet addiction. This supports Chak and Leung’s (2004) finding that shy individuals exhibited more Internet addiction in general. This result also fits to Caplan’s (2007) argument that socially anxious individuals would prefer online social interaction which would further lead to Internet addiction. Additionally, lower level of openness was also found to predict Internet addiction although the effect was small and the significance may be due to the large sample size. There were no previous findings relating Openness to Internet addiction. One possible explanation of this finding could be that less open-minded and more defiant individuals may find some comfort on the Internet that they could not find in their daily life and therefore they become more dependent staying on the Internet.

**Perfectionism**

The results also showed that maladaptive perfectionism in term of discrepancy had a significant positive relationship with Internet addiction whereas perfectionism regarding high standards had a significant negative relationship with Internet addiction. This result partially confirms the only previous study about perfectionism and Internet
addiction in which maladaptive perfectionism was positively related to problematic Internet use but there was no significant relationship between adaptive perfectionism and problematic Internet use (Lehmann & Konstam, 2011). The different findings could be due to different measures used. However, the current finding goes along with previous theories and finding regarding the dichotomous structure of perfectionism which linked maladaptive perfectionism to many negative psychological indicators and adaptive perfectionism to positive psychological factors (Aldea & Rice, 2006; Dunkley, Zuroff, & Blankstein, 2003; Grzegorek, Slaney, Franze, & Rice, 2004; Mobley, Slaney, & Rice, 2005; Slaney, Pincus, Uliaszek, & Wang, 2006). The results also suggest that perfectionism may be a better choice among the lower personality factors of predicting Internet addiction because perfectionism has been found to significantly correlate with neuroticism and conscientiousness (Enns & Cox, 2002) which are two main hypothesized addictive personality components theoretically (Ibáñez, et al., 2008). It makes sense that perfectionism can serve as the predictor for Internet addiction than the Big Five personality factors. The fact that maladaptive perfectionism, neuroticism, and conscientiousness were all found to significantly and negatively associate with Internet addiction in the current study implies that maladaptive perfectionism specifically has the potential to serve as a single personality index to detect people with Internet addiction. The bivariate correlation between maladaptive perfectionism and Internet support this argument because maladaptive perfectionism compared to adaptive perfectionism, conscientiousness, and neuroticism, showed a larger effect size in terms of its relationship with Internet addiction.
Regarding the analyses examining the moderating effect of maladaptive perfectionism on the relationship between perceived stress and Internet addiction, the result showed that neither Discrepancy nor Standards served as the moderators as hypothesized. This insignificant result may still help us explain Internet addiction among college students with the stress-diathesis perspective. According to this result, the effects of stress and maladaptive perfectionism's effect on Internet addiction were additive but not interactive. Therefore, the result does not go against the fundamental conceptualization of stress-diathesis perspective because both stress (e.g., perceived stress) and diathesis (e.g., maladaptive perfectionism) contribute to the development of psychological disorders (e.g., Internet addiction). However, the result does not seem to support maladaptive perfectionism as a relevant moderator under the framework of the Stress Response Dampening Model. Originally, maladaptive perfectionism was hypothesized to be the more likely moderator among the lower-order personality factors because it showed significant relationships with the major components of proposed addictive personality constructs such as neuroticism and conscientiousness. However, the result did not support this choice of moderator under the SRD model.

Although the two aspects of perfectionism, Discrepancy and Standards, did not serve as moderators individually, the significant interaction effect in regression analyses in predicting Internet addiction suggests these two dimensions can be combined to predict Internet addiction. These two dimensions categorize participants into four different types of perfectionists that may have different vulnerability to Internet addiction. Recent studies have supported using the two perfectionism dimensions to form four clusters in predicting eating disorders (Boone, Soenens, Braet, & Goosens, 2010) and
adolescent adjustment (Rice, Ashby, & Gilman, 2011). Rice et al. pointed out that this approach can distinguish the two different groups of participants that were traditionally categorized as one maladaptive perfectionist umbrella. They suggested that the four cluster can be labeled as maladaptive perfectionists (high Standards and high Discrepancy), adaptive perfectionist (high Standards and low Discrepancy), non-perfectionists (low Standards and low Discrepancy), and negative self-evaluation group. As shown in Figure 3-1 and 3-2 regarding the interaction effect of the two perfectionism dimensions, this four-cluster model seems to help explain why participants who had low Standards and high Discrepancy showed the highest scores on Internet addiction.

**Exploratory Analysis**

Exploratory analyses conducted to examine the relationship between Internet addiction and other relevant personality factors found that procrastination was significantly correlated with Internet addiction in the bivariate analysis and the effect size is large. The effect size was even larger than the one for maladaptive perfectionism and Internet addiction. The result suggests that procrastination and maladaptive perfectionism together seemed to be the best predictors for Internet addiction. Frost et al. (1990) found that procrastination was positively related to maladaptive perfectionism and hypothesized that procrastinating people delay work to avoid less than perfect performance. Procrastination was even included as one dimension of perfectionism when the APS-R was first constructed (Johnson & Slaney, 1996). With such close relationship between maladaptive perfectionism and procrastination, procrastination seems to be a good personality moderator candidate like maladaptive perfectionism. However, an exploratory hierarchical multiple relationship showed that procrastination
also was not the right moderator for the relationship between stress and Internet addiction under SRD framework.

Sensation seeking was also linked to Internet addiction although results have been inconsistent (Chou et al., 2005). The bivariate analysis of sensation seeking and Internet addiction did reveal a significant result; however, the effect size was small. This could be due to measurement issue that traditional sensation seeking scale could not detect non-physical type of sensation seeking online (Lavin, et al., 1999). Sensation seeking also did not seem to moderate the relationship between perceived stress and Internet addiction. Finally, impulsivity was found to have a small but significant association with Internet addiction. This result confirms that impulsivity is one of the personality factors that predispose people for addictive behaviors (Ibáñez, et al., 2008). It also seems to somewhat support the theory that Internet addiction can be interpreted as a kind of Impulse control disorder (Young & Rogers, 1998; Young, 1998a; Young, 1998b) although the result can also be interpreted to support conceptualizing Internet addiction with the addictive personality model. Although impulsivity is one of the hypothesized addictive personality factors in the SRD model (Sher & Levenson, 1982), examination of impulsivity as a moderator between perceived stress and Internet addiction also did not reveal a significant result.

Additionally, each of the Big Five personality factors was also explored to see whether any of them would moderate the relationship between perceived stress and Internet addiction. Based on the proposed addictive personality dimensions in the SRD model, outgoing (extraversion), aggressive (agreeableness), impulsive (conscientiousness), and antisocial (agreeableness and conscientiousness) personality
characteristics would moderate the relationship between perceived stress and Internet addiction (Sher & Levenson, 1982). However, the results showed that none of these related Big Five factors had moderating effects; only neuroticism turned out to be an ambiguous moderator between the relationship of perceived stress and Internet addiction under the SRD model. It exhibited a very small moderating effect on the relationship between perceived stress and Internet addiction and the plot of the moderating effect suggested that the significance might have resulted from the large sample size.

In addition, the effect of neuroticism was actually the opposite of what the addictive personality theory would hypothesize (Ibáñez, et al., 2008). This result could be due to that neuroticism was not specifically purposed as one of the predisposing personality characteristics in the initial SRD model (Sher & Levenson, 1982) although it has been hypothesized as one of the main additive personality dimensions by theorists (Ibáñez, et al., 2008). There could be several reasons why the initially purposed personality moderators (e.g., impulsivity, low agreeableness/antisocial and aggressive personality, and outgoingness/extraversion which were examined in the current study) that did not turn out to be relevant. First, the SRD model was initially developed to explain alcoholism but not behavioral addiction like Internet addiction. There could be other personality moderators relevant to Internet addiction that are different from the ones for alcoholism. Second, the SRD model measures stress through biological indexes such as the participant’s heart rate. However, in the current study, stressed was measured by the participants’ subjective and self-reported perceived stress during
the past month. Further research is needed to explore the applicability of using SRD model to explain Internet addiction.

**Significance of Current Study**

In conclusion, this study contributes to the literature regarding Internet addiction in several ways. First, the study result regarding prevalence suggests that Internet addiction is indeed a mental condition worth more attention in research and practice. The alarming high Internet addiction prevalence rate among college students found in this study demands the field of psychology address the unresolved diagnostic and conceptualization issues in research so that many individuals with Internet addiction can receive proper assessment and treatment.

Second, this study contributes to understanding the etiology of Internet addiction. Previous studies regarding Internet addiction focused more on its symptoms and demographic characteristics of those with Internet addiction, but rarely adopted theoretical approaches. In contrast, the current study is the first study to employ a stress-diathesis perspective to explore how stress and personality factors may together predict Internet addiction. As Li et al. (2009) pointed out, there has not been much research directly addressing the contribution of stress to Internet addiction development among college students. Findings from the present study indicate the importance of considering stress as the main predictor for Internet addiction.

Third, this study highlights the importance of studying lower-order personality factors for Internet addiction. Previous studies of the relationship between personality and Internet addiction focused more on higher-order personality factors and had inconsistent results (e.g., Amichai-Hamburger & Ben-Artzi, 2003; Hamburger & Ben-Artzi, 2000; Ko et al. 2006; Ko et al., 2007). This study also examined higher-order
personality factors (e.g., the Big Five personality factors) and helped clarify previously inconsistent results possibly due to smaller sample sizes. In addition, this study examined the lower-order personality factors (i.e., perfectionism and procrastination) and the results show that they may be very important factors for Internet addiction.

Fourth, this study’s finding regarding the interaction of perfectionism subscales supports the new approach to conceptualize perfectionism. For example following the conventional categorization derived from APS-R scores, perfectionists can be distinguished from non-perfectionists with higher scores on Standards, and then among the perfectionists, maladaptive perfectionists can be distinguished from adaptive perfectionists by higher scores on Discrepancy (Rice & Slaney, 2002). However, this three-cluster categorization is not able to predict why the participants who had low Standards scores and high Discrepancy scores had the highest level of Internet addiction whereas the four-cluster dimensional categorization recommended by Rice and colleagues (2011) can serve as a good model to better explain participants’ Internet addiction level in this study.

Finally, this study also tested the SRD model on Internet addiction. Although the results were not expected, they raised several possible research questions for future studies to explore the SRD model’s applicability to Internet addiction and other behavior addictions. Overall, this study bridges many gaps in the Internet addiction literature by employing a theoretical orientation and testing empirical models with standardized instruments. The results of this study set some important foundations for Internet addiction that future studies can build upon.
CHAPTER 5
LIMITATIONS, FUTURE RESEARCH DIRECTIONS, AND PRACTICE IMPLICATIONS

Although this study bridged several important literature gaps and had a rather large sample, there are the following limitations that need to be noted. One of the obvious limitations of this study is that it used a convenience sample. The study invitation was sent to all undergraduate classes’ instructors at UF; however, some of them did not respond and some of them did not offer extra credit as the incentive for their students to participate in this study. Due to the author’s personal connection to the instructors in the psychology department, there were many participants recruited from undergraduate class in the psychology department and from the psychology participant pool. Therefore, there were more female participants than male participants in this sample. Compared to most of the previous studies on Internet addiction that had more male participants, this difference needs to be taken into account when the readers interpret or generalize the results to another population. Another limitation of the study is its correlational design. Although the time sequence was mentioned in the perceived stress measure to suggest a causal inference indicating the influence of perceived stress on current Internet use, it is possible that some participants might have had more perceived stress caused by chaotic lifestyle due to serious Internet addiction symptoms in the first place. The solution to address the question lies in the design of study for future research; only longitudinal and experimental designs could further ascertain the direction of the relationship.

One of the improvements of this study from previous studies is that it used a standardized instrument to measure perceived stress. Although this approach managed to cover participants’ personal stress experience compared to merely counting stressors
or stressful events, it also lost certain comparability among different participants’ stress level. Participants who had similar number or degree of stressful events might have a very different reported perceived stress. The reported perceived stress could be highly related to other factors such as personality characteristics. This could be the reason why that many of the personality factors examined in this study did not show moderating effect on the relationship between stress and Internet addiction. Previous studies using the SRD model as framework usually measured stress through participants’ physical responses such as heart rate, sweating, muscle tension, etc. in the experimental design. This measurement and design difference could be the reason why this study could not find the moderating effects of some personality factors between stress and Internet addiction. Future studies may be able to improve with an experimental and/or longitudinal design to incorporate measure of stress based on participants’ physically responses.

Finally, the use of self-report measures in this study might also have been subject to social desirability and cultural values. For example, agreeableness, conscientiousness, and agreeableness were negatively skewed, which might be the results of the participants’ tendency to provide socially desirable answers. In addition, perfection dimensions such as standards and order are all socially desirable tendencies that participants may endorse more than some other less desirable personality characteristics such as procrastination, impulsivity and neuroticism. Therefore, it is understandable that adaptive perfectionism was severely negatively skewed. Interestingly, cultural values may also play a role for the positive skewness on the variable Impulsivity. Theoretically and clinically, sensation seeking is not considered as
a positive personality characteristic; however, contemporary popular culture may have transformed sensation seeking into a desirable characteristic. Therefore, including a social desirability and/or a cultural value measure in future research may be a viable way to address the issue.

There are several interesting findings from this study that call for further research. First, compared to other related Big Five personality characteristics, conscientiousness showed the strongest correlation with Internet addiction in term of effect size whereas the related construct maladaptive perfectionism and procrastination also exhibited the two strong bivariate correlations with Internet addiction compared to other theoretically related personality constructs. This suggests conscientiousness, maladaptive perfectionism, and procrastination are very important factors for Internet addiction. The further investigation of these constructs and their relationships not only may further clarify the relationships between higher-order and lower-order personality factors but also may elucidate the difference between substance abuse addiction and behavioral addictions such as Internet addiction. Finally, procrastination, which had the strongest correlation with Internet addiction, definitely calls for more examination of its effect on Internet addiction. Although there have already been some studies about Internet addiction and procrastination as a personality trait (Davis et al., 2002b), procrastination can be a difficult concept to define and measure. It is inconclusive in literature whether procrastination should be classified as a personality trait, a behavioral tendency, or merely a symptom of other psychological disorders. In order to define this construct and its relationship with Internet addiction more clearly, the measures and study design in future research should be carefully selected.
Regarding counseling practice, the findings from this study can contribute to help prevent, assess, and treat Internet addiction among college students. Internet addiction can be as stigmatizing a label as traditional substance abuse addiction, or even more stigmatizing for college students. The general public often holds this stereotyped image of the person with Internet addiction as someone who is addicted to online pornography when in fact there are many more common types of addictive online activities (e.g., social network sites, online gaming, etc.). Internet addiction may not be easily or readily detected by college students' friends or family especially when students with Internet addiction are ashamed of, or trying to hide/minimize, their Internet use. Identifying college students who might develop Internet addiction early would be very helpful in preventing these college students from suffering serious symptoms or consequences. The results from this study suggest that experiencing high stress, having personality characteristics such as low conscientiousness, high neuroticism, low extraversion, and low openness, being mal-adaptively perfectionistic, showing signs of procrastination and sensation seeking, and being impulsive would be the risk factors for college students to develop Internet addiction. Therapists could pay attention to clients with many of these risk factors during intake sessions and inquire about potentially problematic Internet use. In addition, therapists can use relatively brief measures of personality, perfectionism, procrastination, and/or Internet addiction to screen at-risk students for preventative interventions. In terms of treatment, therapists might be advised, from the current study’s results, to discuss with clients the ways in which stress and certain personality factors (e.g., maladaptive perfectionism) may lead to maladaptive coping with online activities.
In conclusion, this study not only revealed a relatively high level of Internet addiction among college students but also elucidated the relationships between Internet addiction and perceived stress, higher-order personality factors such as the Big Five personality factors, and lower order personality factors such as perfectionism. The results bridged gaps in the Internet addiction literature and provided practical information that can aid in the assessment and treatment of Internet addiction. Hopefully, this study can spawn further research regarding Internet addiction among the college student population.
APPENDIX A
DEMOGRAPHIC QUESTIONNAIRE

Please complete the following information. Click on the item that best describes you or fill in the blank. Please answer each question as accurately as you can. Remember that all your answers are strictly confidential.

1. What is your age? __________

2. Student Status:
   (a) What is your academic classification?
   A. Freshman
   B. Sophomore
   C. Junior
   D. Senior
   E. Master’s student
   F. Doctoral student
   G. Other

   (b) How many semesters have you finished here at University of Florida? ____________.

   (c) How many semesters in college have you finished altogether? ____________.

3. What is your major or intended major? ________________________________.

4. GPA:
   (a) What is your current GPA? ____________ (out of 4.0 scale).

   (b) If this is your first semester, please indicate your most recent other GPA here (e.g., high school GPA, undergraduate GPA) ________________ (out of 4.0 scale / non-weighted).

5. What is your gender?
   A. Female
   B. Male
   C. Transgender
   D. Other, please specify and write here ____________.
   E. Decline to answer

6. What is your sexual orientation?
   A. Bisexual
   B. Heterosexual
   C. Homosexual
   D. Unsure
   E. Other, please specify and write here ____________.
   F. Decline to answer
7. Race and ethnicity:
(a) Are you Hispanic, Latino(a), and / or of Spanish origin? (The term “Hispanic or Latino or Spanish Origin” is defined as a person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race.)
A. Yes
B. No

(b) In terms of race, please describe the specific group that you identify with the most:
A. American Indian or Alaskan Native
B. Asian
C. Black or African American
D. Native Hawaiian or Other Pacific Islander
E. White
F. Bi-racial or Multi-racial
G. Other

(c) Are you an international student?
A. Yes
B. No

8. Living Situation:
(a) What is your living situation?
A. Off-campus
B. On-campus

(b) Who do you live with?
A. I live alone
B. I live with my family
C. I live with roommates
D. Other, please specify and write here ____________.

9. What is your relationship status?
A. Single
B. In a relationship (including dating, marriage, or civil union, etc.)
C. Other, please specify and write here ____________.

10. What was your age when you first started using the Internet? ________________.

11. Internet Use:
(a) Approximately, how many hours in total per week do you use the internet? (please include the hours of multi-tasking.) ____________

(b) Among the total hours of using the Internet, how many hours do you usually use the internet for leisure and/or entertainment purposes? (please include the hours of multi-tasking; for example, studying and listening to an Internet radio station, such as Pandora, at the same time.) ____________
12. Internet Experience:
(a) Do you have internet access at the place you live now?
A. Yes
B. No

(b) Do you have a data plan for Internet access with your cell phone plan?
A. Yes
B. No

(c) What activity most often keeps you on the Internet?
A. Academic work
B. Online dating
C. Adult content
D. Information surfing (such as reading news or browsing websites)
E. Job requirements / professional needs
F. Online gambling, shopping, and / or stock trading
G. Online game playing and / or programming
H. Social-networking (such as using Facebook, MySpace, or MSN, etc.)
I. Other, please specify and write here ____________.
**APPENDIX B**
**INTERNET ADDICTION SCALE (IAS)**

**INSTRUCTIONS:** The following questions are written in the form of statements. Please read each statement carefully and completely. Indicate the extent to which each statement applies to you by clicking on the option that best reflects the strength of your response. Be sure to respond to the total item and not just a certain part of it. Internet use refers to anything you do online (e.g., email, world wide web, chat rooms, games, cybersex, cyber porn, newsgroups, multi-user dungeons, listservs, Internet Relay Chat etc.).

1. When I attempt to cut back or stop using the Internet I find that the irritability that I experience is relieved by going back on the Internet.
   - Never
   - Rarely
   - Sometimes
   - Frequently
   - Always

2. When I use the Internet now, I do not feel as good as I used to.
   - Never
   - Rarely
   - Sometimes
   - Frequently
   - Always

3. I have stayed on the Internet longer than I intended to.
   - Never
   - Rarely
   - Sometimes
   - Frequently
   - Always

4. I would like to spend less time on the Internet.
   - Never
   - Rarely
   - Sometimes
   - Frequently
   - Always

5. At times I have tried to conceal how long I have been on the Internet.
   - Never
   - Rarely
   - Sometimes
   - Frequently
   - Always

6. I have given up a particular recreational activity in order that I would have more time on the Internet.
   - Never
   - Rarely
   - Sometimes
   - Frequently
   - Always

7. My grades/work have suffered because of my Internet use.
   - Never
   - Rarely
   - Sometimes
   - Frequently
   - Always

8. I have said to myself “just a few more minutes on the Internet.”
   - Never
   - Rarely
   - Sometimes
   - Frequently
   - Always
9. I have lost sleep because of my Internet use.
   Never Rarely Sometimes Frequently Always

10. I see my friends less often because of the time that I spend on the Internet.
   Never Rarely Sometimes Frequently Always

11. I feel that life without the Internet would be boring and empty.
    Never Rarely Sometimes Frequently Always

12. I have neglected things, which are important and need doing.
    Never Rarely Sometimes Frequently Always

13. I find that I need to use the Internet more to get the same enjoyment as before.
    Never Rarely Sometimes Frequently Always

14. The more time I spend away from the Internet, the more irritable I feel.
    Never Rarely Sometimes Frequently Always

15. When I use the Internet, I experience a buzz or a high (i.e., feeling elated).
    Never Rarely Sometimes Frequently Always

16. I have missed class/work so that I would have more time to spend on the Internet.
    Never Rarely Sometimes Frequently Always

17. The Internet has affected my life in a negative way.
    Never Rarely Sometimes Frequently Always

18. Once I am on the Internet, I seem to stay on for a long time.
    Never Rarely Sometimes Frequently Always

19. I have attempted to spend less time on the Internet but I have been unable to do so.
    Never Rarely Sometimes Frequently Always
20. After being on the Internet late into the night I sleep late the next morning because of my Internet use.

Never Rarely Sometimes Frequently Always

21. I find myself doing more things on the Internet than I had intended to.

Never Rarely Sometimes Frequently Always

22. I use the Internet as a way of escaping the “real world.”

Never Rarely Sometimes Frequently Always

23. This is a quality testing question; please choose “Sometimes” as the answer.

Never Rarely Sometimes Frequently Always

24. I find myself thinking/longing about when I will go on the Internet again.

Never Rarely Sometimes Frequently Always

25. I enjoy the pleasure/excitement of being on the Internet.

Never Rarely Sometimes Frequently Always

26. I feel distressed when I am unable to spend as much time on the Internet as I usually do.

Never Rarely Sometimes Frequently Always

27. I have tried unsuccessfully to restrict my Internet use because of previous over use.

Never Rarely Sometimes Frequently Always

28. Since I first began using the Internet I would say that the amount of time I spend on line has increased but not the satisfaction.

Never Rarely Sometimes Frequently Always
29. I find myself accessing more information on the Internet than I had planned to.

   Never    Rarely    Sometimes    Frequently    Always

30. I have felt a persistent desire to cut down or control my use of the Internet.

   Never    Rarely    Sometimes    Frequently    Always

31. When I feel lonely, I use the Internet to talk to others.

   Never    Rarely    Sometimes    Frequently    Always

32. I am on the Internet so much that I have to make up for the lost time.

   Never    Rarely    Sometimes    Frequently    Always
APPENDIX C
THE PERCEIVED STRESS SCALE (PSS)

INSTRUCTIONS:

The questions in this scale ask you about your feelings and thoughts during THE LAST MONTH. In each case, indicate your response by clicking on the circle representing HOW OFTEN you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer fairly quickly. That is, don’t try to count up the number of times you felt a particular way, but rather indicate the alternative that seems like a reasonable estimate.

1. In the last month, how often have you been upset because of something that happened unexpectedly?
   Never     Almost Never     Sometimes      Fairly Often      Very Often

2. In the last month, how often have you felt that you were unable to control the important things in your life?
   Never     Almost Never     Sometimes      Fairly Often      Very Often

3. In the last month, how often have you felt nervous and “stressed”?
   Never     Almost Never     Sometimes      Fairly Often      Very Often

4. In the last month, how often have you dealt successfully with day to day problems and annoyances?
   Never     Almost Never     Sometimes      Fairly Often      Very Often

5. In the last month, how often have you felt that you were effectively coping with important changes that were occurring in your life?
   Never     Almost Never     Sometimes      Fairly Often      Very Often

6. In the last month, how often have you felt confident about your ability to handle your personal problems?
   Never     Almost Never     Sometimes      Fairly Often      Very Often

7. In the last month, how often have you felt that things were going your way?
   Never     Almost Never     Sometimes      Fairly Often      Very Often

8. In the last month, how often have you found that you could not cope with all the things that you had to do?
   Never     Almost Never     Sometimes      Fairly Often      Very Often

9. In the last month, how often have you been able to control irritations in your life?
   Never     Almost Never     Sometimes      Fairly Often      Very Often
10. In the last month, how often have you felt that you were on top of things?
   Never       Almost Never       Sometimes       Fairly Often       Very Often

11. In the last month, how often have you been angered because of things that happened that were outside of your control?
   Never       Almost Never       Sometimes       Fairly Often       Very Often

12. In the last month, how often have you found yourself thinking about things that you have to accomplish?
   Never       Almost Never       Sometimes       Fairly Often       Very Often

13. In the last month, how often have you been able to control the way you spend your time?
   Never       Almost Never       Sometimes       Fairly Often       Very Often

14. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?
   Never       Almost Never       Sometimes       Fairly Often       Very Often
APPENDIX D
THE MINI – INTERPERSONAL PERSONALITY ITEM POOL (MINI-IPIP)

Mini – Interpersonal Personality Item Pool (Mini-IPIP)

How Accurately Can You Describe Yourself?

Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age. So that you can describe yourself in an honest manner, your responses will be kept in absolute confidence. Indicate for each statement whether it is Very Inaccurate, Moderately Inaccurate, Neither Accurate Nor Inaccurate, Moderately Accurate, or Very Accurate as a description of you.

1. Am the life of the party.

<table>
<thead>
<tr>
<th>Very Inaccurate</th>
<th>Moderately Inaccurate</th>
<th>Neither Accurate Nor Inaccurate</th>
<th>Moderately Accurate</th>
<th>Very Accurate</th>
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</thead>
</table>

2. Sympathize with others’ feelings.

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<tr>
<th>Very Inaccurate</th>
<th>Moderately Inaccurate</th>
<th>Neither Accurate Nor Inaccurate</th>
<th>Moderately Accurate</th>
<th>Very Accurate</th>
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</table>

3. Get chores done right away.

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<th>Very Inaccurate</th>
<th>Moderately Inaccurate</th>
<th>Neither Accurate Nor Inaccurate</th>
<th>Moderately Accurate</th>
<th>Very Accurate</th>
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</thead>
</table>

4. Have frequent mood swings.

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<tr>
<th>Very Inaccurate</th>
<th>Moderately Inaccurate</th>
<th>Neither Accurate Nor Inaccurate</th>
<th>Moderately Accurate</th>
<th>Very Accurate</th>
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5. Have a vivid imagination.

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<th>Very Inaccurate</th>
<th>Moderately Inaccurate</th>
<th>Neither Accurate Nor Inaccurate</th>
<th>Moderately Accurate</th>
<th>Very Accurate</th>
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6. Don’t talk a lot.

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<th>Very Inaccurate</th>
<th>Moderately Inaccurate</th>
<th>Neither Accurate Nor Inaccurate</th>
<th>Moderately Accurate</th>
<th>Very Accurate</th>
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7. Am not interested in other people’s problems.

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<tr>
<th>Very Inaccurate</th>
<th>Moderately Inaccurate</th>
<th>Neither Accurate Nor Inaccurate</th>
<th>Moderately Accurate</th>
<th>Very Accurate</th>
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8. Often forget to put things back in their proper place.

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<th>Very Inaccurate</th>
<th>Moderately Inaccurate</th>
<th>Neither Accurate Nor Inaccurate</th>
<th>Moderately Accurate</th>
<th>Very Accurate</th>
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9. Am relaxed most of the time.

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<th></th>
<th>Very Accurate</th>
<th>Moderately Accurate</th>
<th>Neither Accurate</th>
<th>Moderately Inaccurate</th>
<th>Very Inaccurate</th>
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</table>

10. Am not interested in abstract ideas.

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<th></th>
<th>Very Accurate</th>
<th>Moderately Accurate</th>
<th>Neither Accurate</th>
<th>Moderately Inaccurate</th>
<th>Very Inaccurate</th>
</tr>
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</table>

11. Talk to a lot of different people at parties.

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<th>Very Accurate</th>
<th>Moderately Accurate</th>
<th>Neither Accurate</th>
<th>Moderately Inaccurate</th>
<th>Very Inaccurate</th>
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</table>

12. Feel others’ emotions.

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<th>Very Accurate</th>
<th>Moderately Accurate</th>
<th>Neither Accurate</th>
<th>Moderately Inaccurate</th>
<th>Very Inaccurate</th>
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13. Like order.

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<th>Moderately Accurate</th>
<th>Neither Accurate</th>
<th>Moderately Inaccurate</th>
<th>Very Inaccurate</th>
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<th>Very Accurate</th>
<th>Moderately Accurate</th>
<th>Neither Accurate</th>
<th>Moderately Inaccurate</th>
<th>Very Inaccurate</th>
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</table>

15. Have difficulty understanding abstract ideas.

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<th>Very Accurate</th>
<th>Moderately Accurate</th>
<th>Neither Accurate</th>
<th>Moderately Inaccurate</th>
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<th>Very Accurate</th>
<th>Moderately Accurate</th>
<th>Neither Accurate</th>
<th>Moderately Inaccurate</th>
<th>Very Inaccurate</th>
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</thead>
</table>

17. Am not really interested in others.

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<th></th>
<th>Very Accurate</th>
<th>Moderately Accurate</th>
<th>Neither Accurate</th>
<th>Moderately Inaccurate</th>
<th>Very Inaccurate</th>
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</thead>
</table>

18. Make a mess of things.

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<th></th>
<th>Very Accurate</th>
<th>Moderately Accurate</th>
<th>Neither Accurate</th>
<th>Moderately Inaccurate</th>
<th>Very Inaccurate</th>
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</thead>
</table>

19. Seldom feel blue.

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<th>Very Accurate</th>
<th>Moderately Accurate</th>
<th>Neither Accurate</th>
<th>Moderately Inaccurate</th>
<th>Very Inaccurate</th>
</tr>
</thead>
</table>
20. Do not have a good imagination.

<table>
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<tr>
<th>Very Inaccurate</th>
<th>Moderately Inaccurate</th>
<th>Neither Accurate Nor Inaccurate</th>
<th>Moderately Accurate</th>
<th>Very Accurate</th>
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APPENDIX E
THE ALMOST PERFECTION SCALE-REVISED (APS-R)

The following items are designed to measure certain attitudes people have toward themselves, their performance, and toward others. It is important that your answers be true and accurate for you. Please select an option from “strongly disagree” to “strongly agree” that describes your degree of agreement with each item.

1. I have high standards for my performance at work or at school.
   | Strongly Disagree | Slightly Disagree | Neutral | Slightly Agree | Agree | Strongly Agree |
   | Strongly Agree    | Slightly Agree    |        |               |       |               |

2. I am an orderly person.
   | Strongly Disagree | Slightly Disagree | Neutral | Slightly Agree | Agree | Strongly Agree |
   | Strongly Agree    | Slightly Agree    |        |               |       |               |

3. I often feel frustrated because I can’t meet my goals.
   | Strongly Disagree | Slightly Disagree | Neutral | Slightly Agree | Agree | Strongly Agree |
   | Strongly Agree    | Slightly Agree    |        |               |       |               |

4. Neatness is important to me.
   | Strongly Disagree | Slightly Disagree | Neutral | Slightly Agree | Agree | Strongly Agree |
   | Strongly Agree    | Slightly Agree    |        |               |       |               |

5. If you don’t expect much out of yourself you will never succeed.
   | Strongly Disagree | Slightly Disagree | Neutral | Slightly Agree | Agree | Strongly Agree |
   | Strongly Agree    | Slightly Agree    |        |               |       |               |

6. My best just never seems to be good enough for me.
   | Strongly Disagree | Slightly Disagree | Neutral | Slightly Agree | Agree | Strongly Agree |
   | Strongly Agree    | Slightly Agree    |        |               |       |               |

7. I think things should be put away in their place.
   | Strongly Disagree | Slightly Disagree | Neutral | Slightly Agree | Agree | Strongly Agree |
   | Strongly Agree    | Slightly Agree    |        |               |       |               |

8. I have high expectations for myself.
   | Strongly Disagree | Slightly Disagree | Neutral | Slightly Agree | Agree | Strongly Agree |
   | Strongly Agree    | Slightly Agree    |        |               |       |               |

9. I rarely live up to my high standards.
<p>| Strongly Disagree | Slightly Disagree | Neutral | Slightly Agree | Agree | Strongly Agree |
| Strongly Agree    | Slightly Agree    |        |               |       |               |</p>
<table>
<thead>
<tr>
<th>Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Agree</th>
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</thead>
<tbody>
<tr>
<td>10. I like to always be organized and disciplined.</td>
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<td></td>
<td></td>
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<tr>
<td>Strongly</td>
<td>Disagree</td>
<td>Slightly</td>
<td>Neutral</td>
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<tr>
<td>Disagree</td>
<td>Disagree</td>
<td>Disagree</td>
<td>Agree</td>
</tr>
<tr>
<td>11. Doing my best never seems to be enough.</td>
<td></td>
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<tr>
<td>Strongly</td>
<td>Disagree</td>
<td>Slightly</td>
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<tr>
<td>Disagree</td>
<td>Disagree</td>
<td>Disagree</td>
<td>Agree</td>
</tr>
<tr>
<td>12. I set very high standards for myself.</td>
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<tr>
<td>Strongly</td>
<td>Disagree</td>
<td>Slightly</td>
<td>Neutral</td>
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<tr>
<td>Disagree</td>
<td>Disagree</td>
<td>Disagree</td>
<td>Agree</td>
</tr>
<tr>
<td>13. I am never satisfied with my accomplishments.</td>
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<td></td>
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<tr>
<td>Strongly</td>
<td>Disagree</td>
<td>Slightly</td>
<td>Neutral</td>
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<tr>
<td>Disagree</td>
<td>Disagree</td>
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<td>Agree</td>
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<tr>
<td>Strongly</td>
<td>Disagree</td>
<td>Slightly</td>
<td>Neutral</td>
</tr>
<tr>
<td>Disagree</td>
<td>Disagree</td>
<td>Disagree</td>
<td>Agree</td>
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<tr>
<td>15. I often worry about not measuring up to my own expectations.</td>
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<tr>
<td>Strongly</td>
<td>Disagree</td>
<td>Slightly</td>
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<tr>
<td>Disagree</td>
<td>Disagree</td>
<td>Disagree</td>
<td>Agree</td>
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<tr>
<td>16. My performance rarely measures up to my standards.</td>
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<tr>
<td>Strongly</td>
<td>Disagree</td>
<td>Slightly</td>
<td>Neutral</td>
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<tr>
<td>Disagree</td>
<td>Disagree</td>
<td>Disagree</td>
<td>Agree</td>
</tr>
<tr>
<td>17. I am not satisfied even when I know I have done my best.</td>
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<tr>
<td>Strongly</td>
<td>Disagree</td>
<td>Slightly</td>
<td>Neutral</td>
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<tr>
<td>Disagree</td>
<td>Disagree</td>
<td>Disagree</td>
<td>Agree</td>
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<tr>
<td>18. This is a quality testing question; please choose “Strongly Agree” as the answer.</td>
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<tr>
<td>Strongly</td>
<td>Disagree</td>
<td>Slightly</td>
<td>Neutral</td>
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<tr>
<td>Disagree</td>
<td>Disagree</td>
<td>Disagree</td>
<td>Agree</td>
</tr>
<tr>
<td>19. I am seldom able to meet my own high standards for performance.</td>
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<tr>
<td>Strongly</td>
<td>Disagree</td>
<td>Slightly</td>
<td>Neutral</td>
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<tr>
<td>Disagree</td>
<td>Disagree</td>
<td>Disagree</td>
<td>Agree</td>
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</tbody>
</table>
20. I try to do my best at everything I do.

Strongly Disagree Slightly Neutral Slightly Agree Agree Strongly Agree
Disagree


Strongly Disagree Slightly Neutral Slightly Agree Agree Strongly Agree
Disagree

22. I hardly ever feel that what I’ve done is good enough.

Strongly Disagree Slightly Neutral Slightly Agree Agree Strongly Agree
Disagree

23. I have a strong need to strive for excellence.

Strongly Disagree Slightly Neutral Slightly Agree Agree Strongly Agree
Disagree

24. I often feel disappointment after completing a task because I know I could have done better.

Strongly Disagree Slightly Neutral Slightly Agree Agree Strongly Agree
Disagree

25. Using the scale below, please rate the degree to which you agree that you are perfectionistic.

Strongly Disagree Slightly Neutral Slightly Agree Agree Strongly Agree
Disagree
APPENDIX F
THE TUCKMAN PROCRASTINATION SCALE (TPS)

Mark the place for each item that corresponds to yourself.

1. I needlessly delay finishing jobs, even when they're important.
   That’s not me for sure.  That’s not my tendency.  That’s my tendency.  That’s me for sure.

2. I postpone starting in on things I don't like to do.
   That’s not me for sure.  That’s not my tendency.  That’s my tendency.  That’s me for sure.

3. When I have a deadline, I wait till the last minute.
   That’s not me for sure.  That’s not my tendency.  That’s my tendency.  That’s me for sure.

4. I delay making tough decisions.
   That’s not me for sure.  That’s not my tendency.  That’s my tendency.  That’s me for sure.

5. I keep putting off improving my work habits.
   That’s not me for sure.  That’s not my tendency.  That’s my tendency.  That’s me for sure.

6. I manage to find an excuse for not doing something.
   That’s not me for sure.  That’s not my tendency.  That’s my tendency.  That’s me for sure.

7. I put the necessary time into even boring tasks, like studying.
   That’s not me for sure.  That’s not my tendency.  That’s my tendency.  That’s me for sure.

8. I am an incurable time waster.
   That’s not me for sure.  That’s not my tendency.  That’s my tendency.  That’s me for sure.

9. I'm a time waster now but I can't seem to do anything about it.
   That’s not me for sure.  That’s not my tendency.  That’s my tendency.  That’s me for sure.

10. When something's too tough to tackle, I believe in postponing it.
    That’s not me for sure.  That’s not my tendency.  That’s my tendency.  That’s me for sure.

11. I promise myself I'll do something and then drag my feet.
    That’s not me for sure.  That’s not my tendency.  That’s my tendency.  That’s me for sure.

12. Whenever I make a plan of action, I follow it.
    That’s not me for sure.  That’s not my tendency.  That’s my tendency.  That’s me for sure.

13. Even though I hate myself if I don't get started, it doesn't get me going.
    That’s not me for sure.  That’s not my tendency.  That’s my tendency.  That’s me for sure.

14. I always finish important jobs with time to spare.
    That’s not me for sure.  That’s not my tendency.  That’s my tendency.  That’s me for sure.
15. I get stuck in neutral even though I know how important it is to get started.  
That’s not me for sure.  That’s not my tendency.  That’s my tendency.  That’s me for sure.

16. Putting something off until tomorrow is not the way I do it.  
That’s not me for sure.  That’s not my tendency.  That’s my tendency.  That’s me for sure.
APPENDIX G
THE IMPULSIVE SENSATION SEEKING SCALE

DIRECTIONS: Below you will find a series of statements that persons might use to describe themselves. Read each statement and decide whether or not it describes you. If you agree with a statement or decide that it describes you, answer TRUE by clicking on the circle representing “True”. If you disagree with a statement or feel that it is not descriptive of you, answer FALSE by clicking on the circle representing “False”. Answer every statement either True or False even if you are not entirely sure of your answer.

1. I like to have new and exciting experiences and sensations even if they are a little frightening.
   ○ True ○ False

2. I like doing things just for the thrill of it.
   ○ True ○ False

3. I sometimes do "crazy" things just for fun.
   ○ True ○ False

4. I sometimes like to do things that are a little frightening.
   ○ True ○ False

5. I enjoy getting into new situations where you can't predict how things will turn out.
   ○ True ○ False

6. I'll try anything once.
   ○ True ○ False

7. I prefer friends who are excitingly unpredictable.
   ○ True ○ False

8. I like "wild" uninhibited parties.
9. I would like the kind of life where one is on the move and traveling a lot, with lots of change and excitement.

   ○ True ○ False

10. I am an impulsive person.

    ○ True ○ False

11. I like to explore a strange city or section of town by myself, even if it means getting lost.

    ○ True ○ False

12. I would like to take off on a trip with no preplanned or definite routes or timetables.

    ○ True ○ False


    ○ True ○ False


    ○ True ○ False

15. I tend to begin a new job without much advance planning on how I will do it.

    ○ True ○ False

16. I usually think about what I am going to do before doing it.

    ○ True ○ False

17. I often do things on impulse.

    ○ True ○ False
18. I often get so carried away by new and exciting things and ideas that I never think of possible complications.

- True
- False

19. I tend to change interests frequently.

- True
- False


Goldberg, L. R. (1999). A broad-bandwidth, public domain, personality inventory measuring the lower-level facets of several five-factor models. In I. Mervielde, I. J. Deary, F. De Fruyt & F. Ostendorf (Eds.), *Personality psychology in europe* (pp. 7–28). Tilburg, The Netherlands: Tilburg University Press.


BIOGRAPHICAL SKETCH

Tong-An Shueh was born in Taipei, Taiwan. He grew up with his parents, one elder sister and one elder brother. He attended National Central University in Tao-Yuan, Taiwan and graduated in 1998 with a B.A. in English and American literature along with teacher education program. After graduating, Tong-An taught in middle school as an English teacher and a trainee counselor for one year. Tong-An served in the Taiwan Army for two years as a counselor officer. In 2002, he came to the United States to study at Indiana University, Bloomington, where he completed his M.S. in community counseling in 2004 and Ed.S. in mental health counseling in 2005. Tong-An started his doctoral study in counseling psychology program at the University of Florida from Fall 2005. Tong-An received his M.S. in Psychology in 2007 and expects to receive his Ph.D. in counseling psychology in 2011.