

## **Online Time and Gender Perceptions of Internet Addiction**

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*In this study, the means of 216 community college students in the United States were compared based on their perceptions of time spent online, as measured by a 20-item instrument adapted from Dr. Kimberly Young's Internet Addiction (IA) Test (Young, 1996). The statistical analysis included data for freshmen, sophomores, and others. Two-Way Analysis of Variance, with a 2 x 5 factorial design, was used to test for main effects and two-way interaction effects when gender was compared to time spent online. Because there were three derived factors, three separate two-way analysis of variance procedures were conducted. In each analysis, the associated derived factor was used as the dependent variable.*

### **INTRODUCTION**

According to Young (1996), Internet Addiction Disorder (IAD) is an impulse-control disorder, which does not involve any intoxicant. Young suggested that there were four types of triggers that initiate excessive Internet use: (1) application--a particular application that influences the user to be addicted, (2) emotions--the Internet helps the user to be more relaxed and calm, (3) cognition--the Internet acts as therapy for the user to get relief from maladaptive thoughts and catastrophic thinking, and (4) life events--life dissatisfaction (including absence of intimate relationships). Internet Addiction (IA) includes several symptoms (Control Center, 2014), such as (1) a preoccupation with the Internet at inappropriate times, (2) an inordinate amount of time spent on social-networking sites instead of developing relationships in the real world, (3) excessive watching of pornography, which may compromise one's interpersonal relationships, (4) using the Internet to escape negative feelings such as depression or low self-esteem, (5)

weight gain, poor hygiene, carpal tunnel, and other physical effects of an Internet obsession, and (6) jeopardizing work and relationships to use the Internet.

College students represent a particularly vulnerable group, which may make them prone to Internet Addiction (IA). In terms of their daily routines, their schedules provide them with a great deal of flexibility and free time that gives them more opportunities to spend time on various Internet applications (Rotsztein, 2003). According to the literature review, IA is a serious issue to be studied among college students. Therefore, the purpose of this study was to determine if IA was a problem for students in a selected community college in the United States.

The most common factors of IA are gender, age, Big Five personality, chronotype, and country of origin. The articles cited in the literature are concentrated on universities or four-year colleges in China, Indonesia, Italy, Malaysia, Somalia, Turkey, and Yemen where the student bodies were largely traditional students who lived on campus. Conversely, community colleges in the United States have more diverse student bodies and commuter campuses. The academic literature did not reveal any community college studies in the United States that focused on gender and time spent online in relation to IA.

Therefore, our study will answer the following research questions. (1) Is there more than just one dimension of the IA construct concerning community college students' perceptions of IA? (2) Is community college students' perception of IA dependent on gender? (3) Is community college students' perception of IA dependent on time spent online? (4) Is community college students' perception of IA dependent on gender and time spent online?

First, we will discuss the related literature in lieu of our four research questions, thus, justifying our research hypotheses and independent variables: gender and time spent online. Second, we will describe the survey, sample and methods used in this study. Third, we will test our hypotheses. Fourth, and finally, we will explain our findings in lieu of the aforementioned research questions.

## **LITERATURE REVIEW**

Researchers have various reasons for studying young people, mostly college students, in relation to social media usage. Roebuck, Siha, and Bell (2013) found college teachers perceive social media advantages and disadvantages the same regardless of rank or gender and therefore are using similar social media devices to deliver content to their students, including how they are using Web 2.0. Retailers are using social media to market their brands to millennials who do not read newspapers or use landline telephones for receiving and sharing information (Engel, Bell, Meier, Martin, & Rumpel, 2011; Stark, Rumpel, Meier, & Bell 2009). Researchers have examined the bundles of features on cellular phones used by ethnic minority students at a historically black college and university (HBCU) vis-à-vis a rural Midwestern university and found students used phone features in magnitudes of significant differences that favored their nuance peculiarities (Stark, Rumpel, Meier, & Bell 2008).

One study predicted young consumers' usage of electronic social networking devices after surveying 220 undergraduates and 208 high school students across college campuses and found four main social media factors. Young consumers desired (1) immediacy, (2) constant entertainment, (3) social interaction, and (4) the ability to create and record through self-expression, as these values and activities help to develop and enhance their burgeoning identities (Bell, Engel, Meier, Martin, & Rumpel, 2009). The widespread availability of electronic devices which allow for the attainment of these desires makes them ubiquitous in the landscape of high school and college students. Logging onto a social networking site like Facebook or sending instant messages to friends via cell phone or mobile computer are quite commonplace to the millennial generation (Bell, et al 2009). The interest, therefore, in young people's usage of social media, how to market products and services to them, and the time they spend online is of keen interest to information technology researchers.

A study by Chang (2012) of 1,046 undergraduate and graduate students at a national university in Taiwan focused on the Facebook addiction of undergraduate and graduate students. The study also explored the relationships between personality traits, interpersonal relationships, and Facebook addiction. In addition, this study investigated the relationships between using Facebook on smartphones and

Facebook addiction. The results of the survey indicated that (1) Facebook addiction of undergraduate students was higher than graduate students, and the rate of Facebook addiction high-risk groups had the same result, (2) the rate of Facebook addiction high-risk groups of men was higher than women, (3) the students who used Facebook on smartphones were higher on Facebook addiction than those who did not, and the rate of Facebook addiction high-risk groups had the same result, (4) the students with neurotic traits might lead to Facebook Addiction, and (5) interpersonal relationships were negatively correlated with Facebook addiction.

Social network services (SNS) addiction has been viewed as a clinical disorder for treatment. Kang, Shin, and Park (2013) conducted research to study addiction to SNS from a management perspective to study consumer behavior as a possible manageable resource. A survey was administered to prolific users of SNS. The authors performed an exploratory factor analysis on the data to define SNS addiction and to construct its dimensions. The authors termed SNS addiction as an “addictive consumption trait” (ACT) of SNS; and its underlying dimensions are salience, euphoria, immersion, compulsion, and association. With the newly constructed dimensions of ACT of SNS, firms could determine the causal relationships between the attributes of their SNSs on each dimension of ACT of SNS. Once firms understand the influences of each one of the attributes on ACT of SNS, they can reallocate resources to maximize consumers' ACT of SNS to benefit the firms.

Christakis et al. (2011) conducted a pilot survey of 307 college students at two US universities. A total of 224 eligible respondents completed the survey (73% response rate). They concluded that the prevalence of problematic Internet usage among US college students is a cause for concern, and potentially requires intervention and treatment among the most vulnerable groups. The prevalence reported in this study is lower than that which has been reported in other studies; however, the at-risk population is very high and preventative measures are also recommended.

To discuss the influence of peer education on IA in college students, a study was conducted by Zhao et al. (2013) on 54 three-year college students of a university in Anhui Province, China. The researchers concluded that peer education can reduce the Internet Addiction (IA) of college students, increase the psychological health level, and improve the negative dealing measures.

Zainudin, Din, and Othman (2013) conducted a survey of 653 university students (341 females and 312 males) from five different universities in Malaysia. The researchers concluded that Internet applications influenced the Internet usage and students tended to spend most of their time on social networking. In addition, this study produced a guideline for those who wanted to get treatment for Internet Addiction.

A study by Randler, Horzum, and Vollmer (2013) investigated whether Internet Addiction (IA) is associated with age, gender, Big Five personality, and chronotype in a sample of 616 Turkish university students. The researchers found an association between IA and chronotype. Evening-oriented students and males had higher IA scores and agreeable and conscientious students reported lower IA scores. No consistent relationship was observed between students' IA scores and openness to experience, extraversion, and neuroticism. They concluded that evening-oriented students might be more prone to IA than morning-oriented students because evening-oriented students were related to personality styles that foster IA. There does seem to be a relationship between college students' gender and IA, but, the direction of that relationship needs to be further examined empirically.

Rather than looking at Internet Addiction (IA) in general, a study by Kuss, Griffiths, and Binder (2013) focused on particular activities on the Internet that might be potentially addictive and linked them to personality traits that might predispose individuals to IA. The purposes of their study were to assess the prevalence of clinically significant levels of IA and to discern the interplay between personality traits and specific Internet uses in increasing the risk of IA. This cross-sectional online survey used data from 2,257 students of an English university. Results indicated that 3.2% of the students were classified as being addicted to the Internet. Personality traits and uses of online activities explained 21.5% of the variance in IA. A combination of online shopping and neuroticism decreased the risk of IA, whereas, a combination of online gaming and openness to experience increased it. In addition, frequent usage of online shopping

and social online activities, high neuroticism and low agreeableness significantly increased the chances of being addicted to the Internet.

A study by Koc and Gulyagci (2013) explored Facebook addiction among Turkish college students and its behavioral, demographic, and psychological health predictors. The Facebook Addiction Scale (FAS) was developed and its construct validity was determined through factor analyses. A total of 447 students reported their personal information and Facebook usage and completed the FAS and General Health Questionnaire (GHQ-28). The results revealed that weekly time commitment, social motives, severe depression, anxiety, and insomnia positively predicted Facebook addiction. However, demographic variables and the interactions of gender by usage characteristics were not significant predictors.

The impact of self-complexity and Internet Addiction (IA) on attitudes toward online marketing and buying intentions for online travelling products were studied by Hsiao, Yeh, and Tsai (2013). Three hundred and two usable questionnaires were collected. The results were as follows: (1) Self-complexity and IA variables were positively related to attitudes toward online marketing and buying intention for online traveling products, (2) Attitudes toward online marketing were positively related to buying intentions for online traveling products, (3) There were interaction relationships between self-complexity and IA when examining their influences on attitudes toward online marketing for online traveling products and buying intention for online traveling products. Research findings in this study clarified the mutual relationships among attitudes towards online marketing, IA, self-complexity, and buying intentions. The findings also provided practitioners with rich marketing implications.

The purpose of a study by Usman, Alavi, and Shafeq (2014) was to identify the relationship between Internet Addiction (IA) and academic performance among foreign undergraduate students in Universiti Teknologi Malaysia (UTM). This study also identified the differences in IA in terms of gender and country of origin. Four countries were selected through simple random sampling: China, Yemen, Somalia and Indonesia. A total of 120 students were selected randomly from those countries. The results of the study showed that there were no significant differences in IA in terms of gender and country of origin. The results also indicated that there were no significant differences in IA in terms of cumulative GPA. There does, however, seem to be a relationship between the time college students spend online and their perceptions of IA.

According to a study by Servidio (2014), despite increasing interest in IAD, especially among high school students, few investigations have been oriented toward exploring the potential risks associated with the overuse of the Internet for the university population. A sample of 190 Italian university students was selected to investigate the effects of demographic profile, Internet usage, and the Big Five personality traits on IA. Results indicated that none of the enrolled students showed a high level of addiction, although moderate behavioral disorders were found. According to the multiple linear regression findings, males were more inclined to use the Internet than females; and some students' behaviors were predictors of IA. Moreover, personality traits such as Agreeableness and Extraversion were negatively related to IA; whereas, Openness was positively associated. These results indicated that several factors may predispose university students to develop problematic behavior connected with an excessive use of the Internet. It is apparent from the aforementioned literature that college students' gender and their time spent online should have some dependency of each other and thus an influence on their perceptions of IA. However, neither the perception magnitudes nor the direction of the relationship is known at this time.

### **We Therefore Hypothesize:**

*H<sub>1</sub>: There is no main-effect of college students' gender on perceptions of Internet Addiction.*

*H<sub>2</sub>: There is no main-effect of college student' time spent online ( $\leq 1$  -2 hours,  $\leq 4$  hours,  $\leq 5$  hours,  $\leq 8$  hours,  $\geq 10$  hours) on perceptions of Internet Addiction.*

*H<sub>3</sub>: There are no two-way interaction effects between college students' gender and their time spent online ( $\leq 1$  -2 hours,  $\leq 4$  hours,  $\leq 5$  hours,  $\leq 8$  hours,  $\geq 10$  hours) on perceptions of Internet Addiction.*

## SURVEY AND METHODS

Data was collected after receiving university permission. The frequency and percentage for independent variables are summarized in Table 1. The responses also included a measure of students' perceptions of their time spent online over  $\leq 1$  -2 hours,  $\leq 4$  hours,  $\leq 5$  hours,  $\leq 8$  hours, and  $\geq 10$  hours. There were 123 males and 93 females who completed the survey. The study included data for 117 freshmen, 75 sophomores, and 24 others who did not classify as freshmen or sophomores.

**TABLE 1**  
**FREQUENCY AND PERCENT FOR GENDER AND CLASS**  
**AND ITEM MEANS WITH STD. DEVIATIONS**

Independent Variables		Frequency	Percent	Cumulative Percent
Gender	Male	123	56.9	56.9
	Female	93	43.1	100.0
	Total	216	100.0	
Class	Freshmen	117	54.2	54.2
	Sophomore	75	34.7	88.9
	Others	24	11.1	100.0
	Total	216	100.0	
Time Spent Online	$\leq 1$ -2 hours	67	31.0	31.0
	$\leq 4$ hours	64	29.6	60.6
	$\leq 5$ hour	43	19.9	80.5
	$\leq 8$ hours	19	8.8	89.3
	$\geq 10$ hours	23	10.7	100.0
	Total	216	100.0	

### Items Reliability

Twenty Likert-type items were used to measure respondents' perception of Internet Addiction (IA). For the 216 students who completed the survey, all completed enough of these Likert-type items for those items to be useable in factor analysis and factorial ANOVA tests with between subjects design. The 20 items Likert-type scale questions, with choices ranging from "very often," "often," "neutral," "not regularly," to "not at all," were tested for reliability using a Cronbach's (1984) Alpha. The scale reliability shown in Table 2 was .905. Cronbach's Alpha based on Standardized Items was .907. These results exceeded the commonly reported Nunnally (1978) criterion of .70 and the Lance, Butts, and Michels (2006) criterion of .80 for an acceptable alpha. Twenty variables (survey questions 1-20) represent the IA construct that is often described in current literature. If any single item were deleted, the test reliability would not be improved very much.

An alpha of .70 is normally acceptable for nearly all exploratory research cases (Devellis, 1991; Kachigan, 1991; Russell, 2002) but only when the assumption is that the construct to be measured is unidimensional (Cortina, 1993). Furthermore, when the number of dimensions of a single construct is unknown, a principal component factor analysis is normally required to determine the true number of dimensions of a construct in question. Researchers should be cautious about misinterpreting high alphas when the true number of construct dimensions is not known (Cortina, 1993).

### Factor Analysis

To gauge for sampling adequacy, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy Test was .890 and the Bartlett's Test of Sphericity was 1972.058, with degrees of freedom at 190, with  $p = .000$ . These tests are shown in Table 2. The communalities average is .599, just .001 below the .600 threshold

for sample sizes below the rule-of-thumb 300-sample size minimum. Responses to the 20 items measuring IA (labeled IAD1 through IAD20) were subjected to an un-rotated Principal Component Factor Analysis, with a Scree Plot (in IBM's SPSS 22.0). The Scree Plot suggested four factors. An unrotated initial solution also suggested four factors with an eigenvalue of one criterion. Those four factors explained 59.858 percent of variance. Some items correlated higher on more than one factor in the initial solution and the "sweet spot," as some researchers call it, was a three factor solution rather than a four factor solution. A three-factor solution was more parsimonious than a four-factor solution with a cut-off of .40. A variable was said to load on a factor if it had a component loading of .40 or higher on that factor and less than .40 on any other factors (Devellis, 1991; Hatcher, 1994; Kachigan, 1991; Russell, 2002). Factors were derived using Principal Axis Factoring with an initial Promax Rotation. Three factors were deemed appropriate for further analysis. No factor had a factor score greater than  $\pm 2$  in the Factor Score Covariance Matrix as shown in Table 2. The derived factors (accounting for 46.9% of the test variance) were indicative of three dimensions of IA, with a Rotation Sums of Squared Loading 3.774 (18.868%) for factor 1, 3.329 (16.647%) for factor 2, and 2.277 (11.385%) for factor 3, shown in Table 2.

**TABLE 2**  
**KMO AND BARTLETT'S TEST, FACTOR SCORE COVARIANCE MATRIX**  
**AND ROTATION SUMS OF SQUARED LOADINGS**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.890	
Bartlett's Test of Sphericity	Approx. Chi-Square	1972.058	
	df	190	
	Sig.	.000	
<b>Factor Score Covariance Matrix</b>			
Factor	Social Recluse	Internet Addict	Procrastinator
Social Recluse	.814	.089	.055
Internet Addict	.089	.816	.041
Procrastinator	.055	.041	.808
Total Variance Explained			
Factor	<b>Rotation Sums of Squared Loadings</b>		
	Total	% of Variance	Cumulative %
Social Recluse	3.774	18.868	18.868
Internet Addict	3.329	16.647	35.515
Procrastinator	2.277	11.385	46.900

Note: The average communalities = 0.599.

The rotated factor matrix with component loadings and named factors are shown in Table 3. Principal Axis Factoring with Varimax Rotation (factors were considered independent after a Promax rotation was run first) was used to extract the final three factors, which converged in 6 iterations, as shown in Table 3, with item descriptions. Only 13 items (IAD18, IAD19, IAD20, IAD12, IAD3, IAD14, IAD13, IAD15, IAD1, IAD10, IAD2, IAD9, and IAD6) survived the rotation; and the other seven items were not considered when naming the factors. The components that loaded on each factor were used to label that factor. Thus, three names captured the true nature of the semantics represented by the items that loaded onto each factor.

The factors were named based on interpretation of language contained in the components loadings, and naming the factors helps explain the factor loading. For example, the language found in the five components that loaded on Factor 1 combined seems to represent a "Social Recluse." The names capture the meaning of the items loading on each of the factors. Factor 1 was named *Social Recluse* because items IAD18, IAD19, IAD20, IAD12, and IAD3, loading on the factor combined are a semantic approximation

of a person with a need to socialize with others but who at the same time wishes to remain in a reclusive environment. Factor 2 was named *Internet Addict* because items IAD14, IAD13, IAD15, IAD1, IAD10, and IAD2 loading on the factor combined are a semantic approximation of a person who not only needs to be constantly online but is also defensive and secretive about their online time spent. Factor 3 was named *Procrastinator* because items IAD9 and IAD6 loading on the factor combined are semantic approximations of a person who puts off other important tasks, work, and responsibilities because of their addiction to the Internet. This study, therefore, yielded three dimensions to the Internet Addiction (IA) construct consistent with the current literature.

**TABLE 3**  
**ROTATED FACTOR MATRIX WITH ITEM DESCRIPTIONS**  
**AND COMPONENT LOADINGS**

Items	ROTATED FACTOR MATRIX <sup>a</sup>	<i>Social Recluse</i>	<i>Internet Addict</i>	<i>Procrastinator</i>
IAD18	How often do you choose to spend more time online rather going out with others in your physical world?	.739		
IAD19	How often do you feel more comfortable with your virtual friends than real life friends?	.707		
IAD20	How often do you feel sad, emotional, or nervous when you're offline and it changes when you're back to online?	.691		
IAD12	How often do you feel disturbed if someone in the physical world interrupts you when you're online?	.548		
IAD3	How often do you prefer the excitement of the Internet to intimacy/interaction with family and friends?	.515		
IAD14	How often do you find saying to yourself "Just a few more minutes" while online?		.782	
IAD13	How often do you lose sleep and go to bed late due to being online late at night?		.723	
IAD15	How often do you feel the Internet has become an obsession for you?		.604	
IAD1	How often do you find that you stay online longer than you intended?		.601	
IAD10	How often do you feel the desire to go to online when you're offline?		.579	
IAD2	How often do you avoid homework to spend more time online?		.542	
IAD9	How often does your work/business suffer due to your staying online?			.839
IAD6	How often do your business or work suffers because of the amount of time you spend online?			.718

Extraction Method: Principal Axis Factoring. Rotation Method: Varimax with Kaiser Normalization.<sup>a</sup>  
a. Rotation converged in 6 iterations.

## DISCUSSION OF FINDINGS

Because there were three derived factors, three separate two-way analysis of variance procedures were conducted. Two-Way Analysis of Variance, with a 2 x 5 factorial design, was used to test for main effects and two-way interaction effects when gender and time spent online were independent variables. In each analysis, the associated derived factor was used as the dependent variable. The three factors derived from the Principal Axis Factor Analysis with Varimax Rotation can be used as dependent variables in our factorial ANOVA tests. IBM's SPSS 22.0 gives the option of saving factors as regression scores for each of the 216 survey respondents. The factor scores are used as dependent variables, one at a time. Gender (males vis-à-vis females) and time spent online ( $\leq 1$  -2 hours,  $\leq 4$  hours,  $\leq 5$  hour,  $\leq 8$  hours,  $\geq 10$  hours) are independent variables.

**Social Recluse**

We reject H<sub>1</sub>: There is a significant main-effect of gender on perceptions of Social Recluse, with  $F(1, 206) = 6.314, p = .013$ . Gender, with a small size effect ( $\eta^2 = .030$ ) accounts for 3.0% of the variance in the dependent variable: Social Recluse.

We reject H<sub>2</sub>: There is a significant main-effect of time spent online ( $\leq 1-2$  hours,  $\leq 4$  hours,  $\leq 5$  hours,  $\leq 8$  hours,  $\geq 10$  hours) on perceptions of Social Recluse, with  $F(4, 206) = 4.298, p = .002$ . A medium size effect ( $\eta^2 = .077$ ) accounts for 7.7% of the variance in the dependent variable: Social Recluse.

We do not reject H<sub>3</sub>: There are no two-way interaction effects between gender and time spent online ( $\leq 1-2$  hours,  $\leq 4$  hours,  $\leq 5$  hours,  $\leq 8$  hours,  $\geq 10$  hours) on perceptions of Social Recluse, with  $F(4, 206) = .937, p = .444$ . Gender \* time spent online, with a small effect size ( $\eta^2 = .018$ ) accounts for only 1.8% of the variance in the dependent variable: Social Recluse. Therefore, tests of Between-Subject Effects for the two-factor model, a 2 x 5 factorial design on Social Recluse are summarized in Table 4.

**TABLE 4**  
**ANOVA ON SOCIAL RECLUSE TESTING FOR TWO-WAY INTERACTIONS**  
**AMONG ONLINE HOURS SPENT**

Tests of Between-Subjects Effects						
Dependent Variable: Social Recluse						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Gender	4.710 <sup>a</sup>	1	4.710	6.314*	.013	.030
Online Hours	12.827	4	3.207	4.298**	.002	.077
Gender * Online Hours	2.796	4	.699	.937	.444	.018
Error	153.686	206	.746			
Total	175.102	216				
Corrected Total	175.102	215				

a. R Squared = .122 (Adjusted R Squared = .084). Note: \*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$

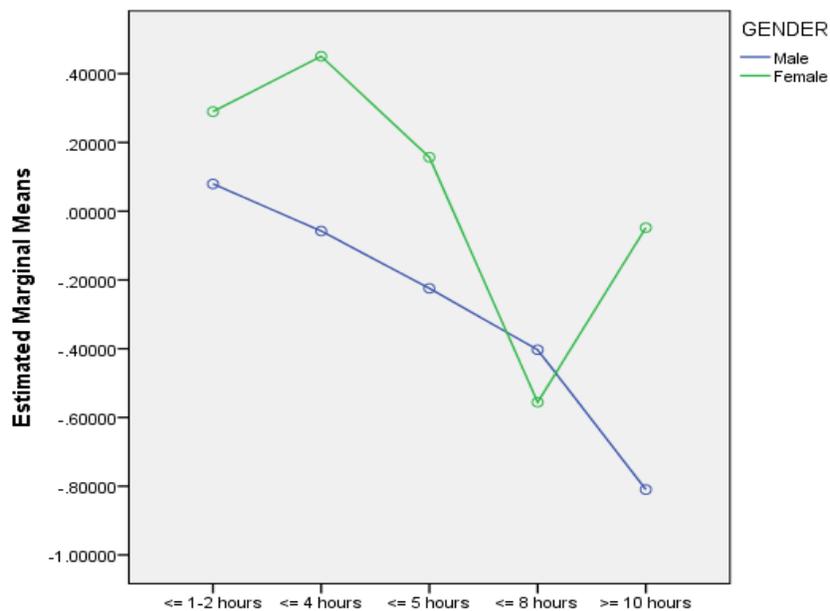
**TABLE 5**  
**MEANS AND STANDARD ERROR FOR SOCIAL RECLUSE**  
**AMONG ONLINE HOURS SPENT**

Dependent Variable: Social Recluse					
GENDER	Online Hours	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Male	$\leq 1-2$ hours	.079	.138	-.193	.352
	$\leq 4$ hours	-.058	.138	-.330	.215
	$\leq 5$ hour	-.225	.188	-.596	.147
	$\leq 8$ hours	-.403	.249	-.895	.088
	$\geq 10$ hours	-.810	.249	-1.301	-.318
Female	$\leq 1-2$ hours	.290	.163	-.032	.612
	$\leq 4$ hours	.451	.173	.110	.791
	$\leq 5$ hour	.157	.184	-.206	.520
	$\leq 8$ hours	-.556	.326	-1.199	.088
	$\geq 10$ hours	-.048	.260	-.561	.466

Table 5 illustrates the means and standard errors for male and females on social recluse among time spent online. For the factor, the male mean is  $-.283$ , while the female mean is  $.059$ , with a  $-.342$  negative mean difference, male minus female mean. Therefore, a male is significantly less prone to be a Social Recluse than a female. The time spent online was highly significant ( $p = .002$ ) with means for  $\leq 2$  hours,  $\leq 4$  hours,  $\leq 5$  hours,  $\leq 8$  hours,  $\geq 10$  hours of  $.185$ ,  $.196$ ,  $-.034$ ,  $-.479$ ,  $-.429$ , respectively. The LSD post hoc comparison shows significant decreasing negative mean differences when  $\geq 10$  hours of time online is compared to the other levels:  $-.613^*$ ,  $-.625^*$ ,  $-.395$ , and  $-.051$ , respectively. This tells us that Social Recluses are much more likely to be online for  $\leq 1-2$  hours,  $\leq 4$  hours and  $\leq 5$  hours rather than be online for  $\leq 8$  hours and  $\geq 10$  hours. Level  $\leq 4$  hours did not differ from level  $\leq 5$  hours or  $\leq 8$  hours, and vice versa. Time online and gender are not dependent on one another and the means for these independent variables do not interact in the model testing Social Recluse.

The R Squared =  $.122$  (Adjusted R Squared =  $.084$ ), which is an indication the independent variables accounted for 8.4% of the variance in the two-way model interact with the dependent variable (Social Recluse) as main effects. No two-way interaction effect ( $p = .243$ ) was detected. Figure 1 illustrates the plot of the estimated marginal means of e-Recluse with gender on the separate lines and time spent online on the horizontal line. The plot ranges from  $-1.0$  to  $+1.0$ , based on the regression scores generated and saved while running the Principal Axis Factor Analysis, with Varimax Rotation in SPSS 22.0.

**FIGURE 1**  
**PLOT OF THE ESTIMATED MARGINAL MEANS OF SOCIAL RECLUSE FOR MALE AND FEMALE ON TIME SPENT ONLINE**



### Internet Addict

We do not reject  $H_1$ : There is no significant main-effect of gender on perceptions of Internet Addict, with  $F(1, 206) = .617$ ,  $p = .433$ . Gender, with a small size effect ( $\eta^2 = .003$ ) accounts for 0.30% of the variance in the dependent variable: Internet Addict.

We reject  $H_2$ : There is a significant main-effect of time spent online ( $\leq 1-2$  hours,  $\leq 4$  hours,  $\leq 5$  hours,  $\leq 8$  hours,  $\geq 10$  hours) on perceptions of Internet Addict, with  $F(4, 206) = 8.492$ ,  $p = .000$ . Internet Addict, with a large size effect ( $\eta^2 = .142$ ) accounts for 14.2% of the variance in the dependent variable: Internet Addict.

We do not reject  $H_3$ : There are no significant two-way interaction effects between gender and time spent online ( $\leq 1-2$  hours,  $\leq 4$  hours,  $\leq 5$  hours,  $\leq 8$  hour,  $\geq 10$  hours) on perceptions of Internet Addict, with  $F(4, 206) = 1.093, p = .361$ . Gender \* time spent online, with a small effect size ( $\eta^2 = .021$ ) accounts for only 2.1% of the variance in the dependent variable: Internet Addict. Therefore, tests of Between-Subject Effects for the two-factor model, a 2 x 5 factorial design on Internet Addict are summarized in Table 6.

For the Internet Addict factor, the male mean is -101, while the female mean is -206, with a -.105 negative mean difference, female minus male mean. Therefore, males are slightly more prone to be Internet Addicts than females, but not significantly so. The time spent online was highly significant ( $p = .000$ ) with a means for  $\leq 1-2$  hours,  $\leq 4$  hours,  $\leq 5$  hours,  $\leq 8$  hours,  $\geq 10$  hours of .412, .006, -.058, -.539, -.589, respectively.

**TABLE 6**  
**ANOVA ON INTERNET ADDICT TESTING FOR TWO-WAY INTERACTIONS**  
**AMONG ONLINE HOURS SPENT**

Tests of Between-Subjects Effects						
Dependent Variable: Internet Addict						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Gender	0.442 <sup>a</sup>	1	.442	.617	.433	.003
Online Hours	24.328	4	6.082	8.492***	.000	.142
Gender * Online Hours	3.131	4	.783	1.093	.361	.021
Error	147.530	206	.716			
Total	175.485	216				
Corrected Total	175.485	215				

a. R Squared = .159 (Adjusted R Squared = .123). Note: \*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$

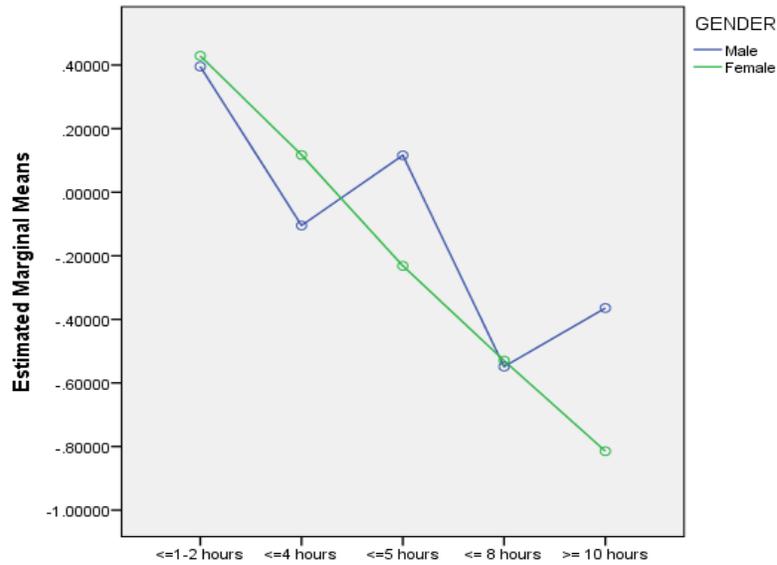
Table 7 illustrates the means and standard errors for online time spent. The LSD post hoc comparison shows significant decreasing negative mean differences when  $\geq 10$  hours of time online is compared to the other levels: -.989\*, -.562\*, -.518\*, and -.038, respectively. It adds integrity to the test given that responses appear truthful and authentic. This tells us that Internet Addicts are much more likely to be online for  $\leq 1-2$  hours and  $\leq 4$  hours rather than be online for  $\leq 8$  hours and  $\geq 10$  hours. Level  $\leq 4$  hours did not differ from level  $\leq 5$  hours. Time online and gender are not dependent on one another and means for these independent variables do not interact in the model testing Internet Addict.

**TABLE 7**  
**MEANS AND STANDARD ERROR FOR INTERNET ADDICT**  
**AMONG ONLINE HOURS SPENT**

Dependent Variable: Internet Addict					
LSD					
(I) Online Hours	(J) Online Hours	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval
					Lower Bound
≤ 1-2 hours	≤ 4 hours	.428*	.148	.004	0.136
	≤ 5 hour	.471*	.165	.005	0.145
	≤ 8 hours	.951*	.220	.000	0.518
	≥ 10 hours	.989*	.205	.000	0.586
≤ 4 hours	≤ 1-2 hours	-.428*	.148	.004	-0.719
	≤ 5 hour	.044	.167	.794	-0.285
	≤ 8 hours	.524*	.221	.019	0.088
	≥ 10 hours	.562*	.206	.007	0.156
≤ 5 hour	≤ 1-2 hours	-.471*	.165	.005	-0.797
	≤ 4 hours	-.044	.167	.794	-0.373
	≤ 8 hours	.480*	.233	.041	0.020
	≥ 10 hours	.518*	.219	.019	0.087
≤ 8 hours	≤ 1-2 hours	-.951*	.220	.000	-1.385
	≤ 4 hours	-.524*	.221	.019	-0.960
	≤ 5 hour	-.480*	.233	.041	-0.940
	≥ 10 hours	.038	.262	.885	-0.479
≥ 10 hours	≤ 1-2 hours	-.989*	.205	.000	-1.392
	≤ 4 hours	-.562*	.206	.007	-0.967
	≤ 5 hour	-.518*	.219	.019	-0.949
	≤ 8 hours	-.038	.262	.885	-0.555

The R Squared = .159 (Adjusted R Squared = .123), which is an indication the independent variables accounted for 12.3% of the variance in the two-way model and is meaningful only on the two main effects, but not in the interaction effect. Although there was no significant two-way interaction effect ( $p = .361$ ), Figure 2 illustrates the plot of the estimated marginal means of Internet Addict with gender on the separate lines and time spent online on the horizontal line. The plots range from -1.0 to +1.0, based on the regression scores generated and saved while running the Principal Axis Factor Analysis, with Varimax Rotation in SPSS 22.0.

**FIGURE 2**  
**PLOT OF THE ESTIMATED MARGINAL MEANS OF INTERNET ADDICT**  
**FOR MALE AND FEMALE ON TIME SPENT ONLINE**



**Procrastinator**

We do not reject  $H_1$ : There is no significant main-effect of gender on perceptions of Procrastinator, with  $F(1, 206) = .146, p = .703$ . Gender, with a small size effect ( $\eta^2 = .001$ ) accounts for 0.10% of the variance in the dependent variable: Procrastinator.

We do not reject  $H_2$ : There is no significant main-effect of time spent online ( $\leq 1-2$  hours,  $\leq 4$  hours,  $\leq 5$  hours,  $\leq 8$  hours,  $\geq 10$  hours) on perceptions of Procrastinator, with  $F(4, 206) = .762, p = .551$ . Job type, with a small size effect ( $\eta^2 = .015$ ) accounts for 1.5% of the variance in the dependent variable: Procrastinator.

And, we do not reject  $H_3$ : There are no significant two-way interaction effects between gender and time spent online ( $\leq 1-2$  hours,  $\leq 4$  hours,  $\leq 5$  hours,  $\leq 8$  hours,  $\geq 10$  hours) on perceptions of e-Procrastinator, with  $F(4, 206) = 1.228, p = .300$ . Gender \* time spent online, with a small effect size ( $\eta^2 = .023$ ) accounts for only 2.3% of the variance in the dependent variable: Procrastinator. Therefore, tests of Between-Subject Effects for the two-factor model, a 2 x 5 factorial design on Procrastinator are summarized in Table 8.

**TABLE 8**  
**ANOVA ON PROCRASTINATOR TESTING FOR TWO-WAY INTERACTIONS AMONG**  
**ONLINE HOURS SPENT**

Tests of Between-Subjects Effects						
Dependent Variable: Procrastinator						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Gender	0.118 <sup>a</sup>	1	.118	.146	.703	.001
Online Hours	2.466	4	.616	.762	.551	.015
Gender * Online Hours	3.975	4	.994	1.228	.300	.023
Error	166.653	206	.809			
Total	173.695	216				
Corrected Total	173.695	215				

a. R Squared = .041 (Adjusted R Squared = -.001). Note: \*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$

## ANSWERS TO THE AFOREMENTIONED RESEARCH QUESTIONS

Now that we have presented results for our hypotheses testing, we can answer the aforementioned research questions concerning our Internet addictive disorders test.

### Question #1

Is there more than just one dimension of the Internet addictive construct concerning community college students?

*Answer:* Yes, there are three dimensions of Internet Addiction (IA) construct as perceived by the community college students who completed the 20 items questionnaire on IA. The 20 original items were reduced to 13 items in a factor analysis that represents three derived factors and accounted for 46.9% of the scale variance. According to the literature review, the articles cited concentrated on international universities or four-year colleges. The literature review did not find any community college studies in the United States that focused on gender and time spent online. Therefore, our study attempts to fill this void.

### Question #2

Is Internet addictive behavior dependent on a student's gender?

*Answers:* Yes and no; Internet Addiction (IA) is dependent on gender for Social Recluse but not for Internet Addict or Procrastinator. Female community college students in our study are more prone to Social Recluses than their male counterparts. Randler et al. (2013) did not include the three factors (Internet Addict, Social Recluses, and Procrastinator) derived in our study. Their study found that males had higher IA scores in general.

### Question #3

Is Internet addictive behavior dependent on time spent online?

*Answers:* Yes and no; Internet Addiction (IA) is dependent on the time community college students spent online for Social Recluses and Internet Addicts but not for Procrastinators. The big difference was  $\geq 10$  hours online and all the other times student reported being online with the negative mean differences declining as time online declines. Time online did not differ significantly for the Procrastinators regardless of the length of time. A study by Koc and Gulyagci (2013) revealed that weekly time commitment was a positive predictor of Facebook addiction. Our study concurs on the time commitment. Our study found that the two types of community college students (Social Recluses and Internet Addict) do spend more time online; therefore, they may be more susceptible to IA.

### Question #4

Is Internet addictive behavior dependent on both time spent online and gender of the Internet users?

*Answers:* No. No. No. Adding time as an independent factor seems to have neutralized the differences between genders found earlier in the main effects tests in the Social Recluse and Internet Addict models. Therefore, Internet Addiction (IA) is not dependent on gender when time online is an independent factor compared on Social Recluse or Internet Addict or Procrastinator as dependent variables. It is safe to say, for this study, that males and females are statistically the same on the perceptions of their IA behaviors when time is considered in the models. Therefore, we can argue that community college students in the study are the same when it comes to Social Recluse or Internet Addict or Procrastinator, regardless of the declining mean differences and hours spent online as indicated in Figures 1 and 2.

## REFERENCES

Bell, R. L., Engel, C. J., Meier, R. J., Martin, M. J., & Rumpel, J. H. (2009). Predicting young consumers' usage of electronic social networking devices. *International Journal of Business, Marketing and Decision Sciences*, 2 (2), 16-32.

- Chang, Yu-Chieh. (2012). The study of students' Facebook addiction: Take university students and graduate students as examples. National Central University. *ProQuest Dissertations and Thesis*.
- Christakis, D. A., Moreno, M. M., Jelenchick, L., Myaing, M. T., & Zhou, C. (2011). Problematic internet usage in US college students: A pilot study. *BMC Medicine*, 9(77) 1-6.
- Control Center, the. (2014). IA treatment. Retrieved April 9, 2014 from <http://www.thecontrolcenter.com/what-we-treat/behavioral-addiction-treatment/Internet-addiction-treatment/>
- Cortina, J. M. (1993). What is coefficient alpha? An examination of theory and applications. *Journal of Applied Psychology*, 78 (1), 98-104.
- Cronbach, L. (1984). *Essentials of psychological testing*. New York: Harper and Row.
- Devellis, R. (1991). *Scale development*. Newbury Park, CA: Sage Publications.
- Engel, C. J., Bell, R. L., Meier, R. J., Martin, M. H., & Rumpel, J. H. (2011). Young consumers in the new marketing ecosystem: An analysis of their usage of interactive technologies. *Academy of Marketing Studies Journal*, 15 (2), 23-44.
- Hatcher, L. (1994). *A step-by-step approach to using the SAS (R) system for factor analysis and structural equation modeling*. Cary, NC: SAS Institute.
- Hsiao, C., Yeh, S., & Tsai, C. (2013). The impact of self-complexity on attitudes towards online marketing and buying intentions: Using the IA as a moderator. *Marketing Review / Xing Xiao Ping Lun*, 1(10), 0-9.
- Kachigan, S. K. (1991) *Multivariate statistical analysis*. New York: Radius Press.
- Kang, I., Shin, M. M., & Park, C. (2013). IA as a manageable resource: A focus on social network services. *Online Information Review*, 37(1), 28-41.
- Koc, M., & Gulyagci, S. (2013). Facebook addiction among Turkish college students: The role of psychological health, demographic, and usage characteristics. *Cyberpsychology, Behavior, and Social Networking*, 16(4), 279-284.
- Kuss, D. J., Griffiths, M. D., & Binder, J. F. (2013). IA in students: Prevalence and risk factors. *Computers in Human Behavior*, 29(3), 959-996.
- Lance, C. E., Butts, M. M., & Michels, L. C. (2006). The sources of four commonly reported cutoff criteria: What did they really say? *Organizational Research Methods*, 9(2), 202-220.
- Nunnally, J. (1978) *Psychometric theory*. New York: McGraw-Hill.
- Randler, C., Horzum, M. B., & Vollmer, C. (2013). IA and its relationship to chronotype and personality in a Turkish university student sample. *Social Science Computer Review*, 32(4), 1-12.
- Roebuck, D. B., Siha, S., & Bell, R. L. (2013). Faculty usage of social media and mobile devices: An analysis of advantages and concerns. *Interdisciplinary Journal of E-Learning and Learning Objects*, 9 (1), 171-192.
- Rotsztein, B. (2003). Problem Internet use and locus of control among college students: Preliminary findings, 35th Annual Conference of the New England Educational Research Organization.
- Russell, D. W. (2002). In search of underlying dimensions: The use (and abuse) of factor analysis in Personality and Social Psychology Bulletin. *Personality and Social Psychology Bulletin*, 28(12), 1629-1646.
- Servidio, R. (2014). Exploring the effects of demographic factors, Internet usage and personality traits on IA in a sample of Italian university students. *Computers in Human Behavior*, 35, 85-92.
- Stark, J., Rumpel, J. H., Meier, R. J., & Bell, R. L. (2009). A three campus comparison of bundled cellular telephone features and the young consumer. *Journal of Business and Leadership: Research, Practice, and Teaching*, 5 (2), 33-42.
- Stark, J., Rumpel, J. H., Meier, R. J., & Bell, R. L. (2008). Rural and ethnic young consumers' perceptions of bundled cellular telephone features. *Academy of Marketing Studies Journal*, 12 (2), 1-18.
- Usman, N. H., Alavi, M., & Shafeq, S. M. (2014). Relationship between IA and academic performance among foreign undergraduate students. *Procedia-Social and Behavioral Sciences*, 114, 845-851.
- Young, K. S. (1996). *Caught in the net: How to recognize the sign of IA and a winning strategy for recovery*. New York: John Wiley & Sons.

- Zainudin, A., Din, M. M., & Othman, M. (2013). CIMP Internet Addiction Guideline. *International Journal of Asian Social Science*, 3(9), 1967-1972.
- Zhao, J., Qi, Y., Wang, L., Ma, Y., & Xue, F. (2013). Effect of peer education on Internet addiction intervention in college students. *Journal of Bengbu College*. Bengbu Medical College, Anhui, China.