

## THE ASSESSMENT OF ONLINE USAGE: FROM HEALTHY USE TO ONLINE DEPENDENCE

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The Online Usage Inventory (OUI) was developed and used to assess the Internet use of 203 university students. The instrument consisted of the HOU-ODD continuum and 5 subtypes. The final reliability analysis of the HOU-ODD continuum revealed a Chronbach's alpha of .94, and the final reliability analyses of the 5 subtypes yielded alphas ranging from .76 to .87. An Exploratory Factor Analysis was conducted on the HOU-ODD scale and a one-factor solution was deemed the most salient result. Concurrent validity was measured and was in accord with the hypothesis that those who scored high on the HOU-ODD continuum also scored high on the depression measure and impulsivity measure.

Internet Addiction Disorder (IAD), Pathological Internet Use (PIU), and Internet Behavior Dependence (IBD) describe a phenomenon that has occurred since the advent of the Internet: Addiction to the Internet through its pathological overuse. The cognitions and behaviors of the Internet-addicted parallel those observed in individuals with substance dependence and abuse. However, these individuals are seeking treatment for a disorder that has yet to be uniformly defined by the Mental Health field. Without this classification, mental health clinicians have limited treatment options and referral sources. To date, psychologists worldwide struggle to formulate the most effective theoretical construct that would yield the truest representation of Internet addiction. Much of this difficulty lies within the differentiation between healthy versus pathological Internet use. What was once a popular gauge of destructive Internet overuse, the amount of time spent Online, is now becoming obsolete as the Internet increasingly becomes an integral and pervasive part of today's society, necessitating greater usage. More to what researchers are now analyzing are the specific Online activities that perpetuate pathological use.

According to the *World Almanac and Book of Facts* (2003), the Nielsen//Net ratings international data indicated that in 2002 the United States had the highest in-home Internet access rate of over 166 million users; China was the second highest with 56 million. In addition, the United States and Canada were the only countries with a female-dominated Online population. Current research suggests the Online population in the United States has stabilized in the past few years, yet the amount of hours spent Online has increased (Lebo, 2003). Such a finding provides the impetus for many researchers to analyze which activities are accessed Online.

The Stanford Institute for the Quantitative Study of Society (SIQSS), a Stanford University organization that uses empirical data and statistical analysis to analyze society and social change, conducted a study assessing the social consequences of the Internet in 2000. Their study revealed email, general information, surfing, reading, and hobbies were the top five Online activities in 2000. The Pew Internet and American Life Project (Pew Internet Project), a research organization established in 2000, is funded by the Pew Charitable Trusts and continually examines the impact of the Internet on social, occupational, and academic life. In 2001, the Pew Internet Project found that email, searching for specific information, reading news, buying products, and listening/downloading music were the most popular Online activities. The University of California Los Angeles (UCLA) Internet Project, which surveyed more than 2,000 households across America for the years 2000, 2001, and 2002, reported that the five most popular Internet activities in 2002, by percentage of Internet users, were email/instant messaging (87.9), web surfing or browsing (76.0), reading news (51.9), accessing entertainment information (46.4), and shopping/buying Online (44.5). Moreover, in the mid-1990s the average Internet user spent approximately 5 hours a week Online (Young, 1996). In 2000 and 2001, the average user spent about 9 hours Online, and in 2002, individual Online use increased to 11 hours per week (Lebo, 2003).

### *Pioneers of Internet Addiction Classification*

Goldberg, a psychiatrist, coined the term "Internet Addiction Disorder" in 1995 as he was joking with his peers (Yang, 2000). Continuing his parody, he listed a set of criteria on a listserv (an electronic conversation among a group of people who share a common interest) to mental health professionals. Contrary to his expectations, professionals responded to the list of criteria and

suggested they may be addicted to the Internet or know someone who is (Garrison & Long, 1995). In response, Goldberg established an Online support group for those suffering from Internet Addiction called the Internet Addiction Support Group (Goldberg, personal communication, July 9, 1995), acknowledging that excessive Internet use could lead to some pathology (Garrison & Long, 1995).

Goldberg is no longer involved with the study of Internet addiction. However, what he initially created as a parody on alcoholism was the starting point for interested Internet addiction researchers of the time.

Kimberly Young was the first psychologist to present the concept of Internet addiction before the American Psychological Association (APA). On August 10, 1996, she addressed the APA's 104<sup>th</sup> annual convention with her presentation on 'Pathological Internet Use: The Emergence of A New Clinical Disorder' (Young, 1996). Her theory was initially supported by the results of a study she conducted with 496 heavy Online users who were administered her eight-item checklist for Internet addiction. It was Young's contention that pathological gambling is most comparable to Internet addiction because it addresses failed impulse control without involving the ingestion of toxic substances (Young, 1996). By adapting the DSM-IV's criteria for pathological gambling to suit pathological Internet behavior, Young developed a set of criteria. If an individual meets five or more of these criteria over a 12-month period, they would be classified as Internet dependent. Her checklist (Young, 1996) includes a preoccupation with the Internet, increased time spent Online to achieve satisfaction, unsuccessful attempts to control Internet use, unintentionally longer time spent Online, jeopardizing significant life events, and use of the Internet as an escape.

According to Young (1996), the results of her study revealed those who were classified as Internet dependent exhibited significant addictive behavioral patterns. In addition, she found that the dysfunctional use of the Internet significantly disrupted the "dependent users" academic, social, financial and occupational life in the same manner other well-documented addictions do, such as pathological gambling, eating disorders and alcoholism. Furthermore, she was able to distinguish between the addicted or dependent users and the healthy or "non-dependent" users. To healthy users, the Internet is a resource tool that also provides a means of personal and business communication; yet, addicted users more enjoy aspects of socialization with strangers through interactive means (Young, 1996). This finding prompted Young to continue research into understanding the differences between dependent and non-dependent users.

With continued research efforts, Young surveyed mental health practitioners who had experience in treating Internet addicts. The respondents reported an average of nine clients meeting Young's criteria for Internet addiction. Qualitative results from the study yielded five subtypes of Internet addiction (Young, Pistner, O'Mara & Buchanan, 1999): 1) *cybersexual addiction*, an addiction to adult chat rooms or cyberporn; 2) *cyberrelationship addiction*, online friendships made in chat rooms or cyberporn; 3) *net compulsions*, compulsive gambling, day trading, or auction shopping; 4) *information overload*, compulsive Web or database surfing; and 5) *computer addictions*, compulsive game playing or programming. All of these addiction subtypes are compulsions (behaviors that alleviate obsessive thoughts) that are distinguished by their specific and driving obsessions. For example, the cybersexual addicts felt the freedom to act out their illicit sexual impulses (e.g., voyeurism, child pornography) without a fear of negative consequences that would typically result if done in real life, such as incarceration, social disapproval, or jeopardizing relationships.

#### *Alternate Theories*

With the prevalence of addictive behaviors associated with pathological gambling, compulsive shopping, excessive expressions of sexual desires, and eating disorders, non-chemical addictions have created a domain of their own (Hall & Parsons, 2001). Though pioneers of Internet addiction were inspired by the chemical addiction model, it is more the non-chemical addiction disorders that recent researchers are inclined to compare to Internet addiction. Consequentially, a discrepancy among terminologies describing Internet addiction surfaced. Researchers, such as, Davis (2001), Hall and Parsons (2001), find it more appropriate to refrain from using the term addiction. The label addiction is historically associated with the abuse and dependence of a digestible source

(Garrison & Long, 1995; Young, 1996; Griffiths, 1998; Hall & Parsons 2001). Attempting to establish a disorder labeled with an inaccurate descriptive minimizes its credibility.

On the other hand, Griffiths (2000) feels the term addiction is an accurate representation of pathological Internet usage. Internet Addiction Disorder can be described as similar to other types of addictions, being that there is a development of tolerance, a need to access the Internet for longer periods of time, ineffective attempts to decrease Internet use, exponential time spent on Internet-related activities, and damage to social/occupational responsibilities, it is evident that there is still no common ground as to what its working definition should be. Yet, according to the DSM-IV, addiction describes the dependence of a substance, while the term pathological is reserved for non-substance related addictions, such as gambling (Davis, et al., 1999). This differentiation among the terminologies illuminates the difficulties that researchers face in developing an accurate Internet addiction model. Therefore, the struggle ensues in determining the most appropriate terminology.

Mark Griffiths contends that once pathological gambling, a behavioral disorder, is summarily recognized as an addiction, making it comparable to the historic substance-ingested model, then Internet addiction can be legitimized (Griffiths, 1998). However, Griffiths feels that until that point is reached, the current definitions for Internet Addiction Disorder are flawed. The reason being that they lack measures for severity, have no temporal dimensions, have a tendency to overestimate the prevalence of problems and don't take into account the context of the Internet use (Griffiths, 2000). Rather, Griffiths' working definition for his term, technological addiction, is "...a nonchemical (behavioral) addiction that involves excessive human-machine interaction... and usually contains inducing and reinforcing features that may contribute to the promotion of addictive tendencies."(2001, p. 334). Griffiths also felt that technological addictions feature the universal core components of addiction, which include salience, mood modification, tolerance, withdrawal, conflict, and relapse.

Among the more common alternatives for the descriptive terminology of Internet addiction is Pathological Internet Use (PIU), as is used by Richard A. Davis. Elaborating on this concept further, Davis (2001) proposed that Pathological Internet Use could be categorized as either Specific Pathological Internet Use (SPIU) or Generalized Pathological Internet Use (GPIU) (Hall & Parsons, 2001). Specific pathological Internet use describes those individuals who are dependent on a specific function of the Internet, such as Online stock trading or Online sexual material/services. While, generalized pathological Internet use involves a multidimensional overuse of the Internet and its social aspects, such as emails and chat rooms.

Davis (2001) believes that such pathological Internet use stems from problematic cognitions, which lead to maladaptive behavioral reactions that are triggered by a pre-existing pathology; thereby viewing Internet addiction as a vehicle for an existing pathology to manifest itself. He also emphasizes that his theory of pathological Internet use is "a departure from other theories in that it emphasizes the individual's cognitions (or thoughts) as the main source of abnormal behavior" (2001, p. 188).

Another theory is Internet Behavior Dependence (IBD). This concept posited by Hall and Parsons (2001) suggests that maladaptive Internet use impairs the cognitive, behavioral, and affective functioning of a healthy individual. It does not reflect upon pathological predispositions nor is it severe enough of a disorder that creates its own pathology. Hall and Parsons (2001) believe that Internet behavior dependence is simply excessive Internet use and such use is an attempt to compensate for dissatisfaction in other areas of the person's life. Moreover, Hall and Parsons (2001) stated "Our term, IBD, may be superior to previous definitions because it embraces a holistic and humanistic framework that complements our understanding of the client's world." (p. 315). This holistic perspective clearly encompasses the integrative nature of an individual's cognitions, affect and behaviors, and how excessive Internet use may influence them.

It is evident that there is a substantial overlap among all the three definitions. All three models cite the following, in part, as criteria for Internet addiction: increased use with less satisfaction, inability to cut-down use, failure to meet life-obligations, continued

use despite the awareness of resulting ill-effects. The components of their definitions that are the distinguishing factors are seemingly that which embodies their collective shortcomings: Too general, too specific, and minimizing severity. What is agreed upon, however, is the fact that evidence of Internet-related disorders is surfacing in mental health clinics. Hence, there is a need to better understand the disorder, as well as, which population is more susceptible to Internet addiction.

### *The Online Usage Inventory*

The OUI is operationally defined as an assessment tool that indicates the degree of effect Internet usage has on an individual's cognitions, emotions and behaviors in terms of addiction symptomatology. To indicate the degree of effect, Internet usage will be measured on a continuum ranging from *Healthy Online Use* (HOU) to *Online Dependence Disorder* (ODD). Furthermore, the scale is designed to measure *subtypes* of those who meet the criteria for ODD.

The term Healthy Online Use (HOU) describes the use of the Internet with functional behavior, cognitive flexibility, and emotional stability, which does not interfere with daily living. Individuals can utilize the Internet for multiple purposes, find it easy to switch focus from one task to another, and are not emotionally affected by its usage. Likewise, these persons may also indicate that they spend all of their time online doing one specific activity (i.e., interactive gaming), but are considered healthy users because they are able to switch or stop that activity at any time and do not feel the compulsion to resume participation. Furthermore, the Internet usage does not impede upon the fulfillment of work/academic responsibilities, interpersonal obligations, or quality of life.

The concept Online Dependence Disorder (ODD) is modeled after the DSM-IV criteria for gambling and substance dependence, and is amended to address what it means today to be addicted to the Internet. It is defined as a set of addiction symptomatology observed through maladaptive cognitions, emotions, and behaviors (obsessive preoccupation, euphoria-seeking, compulsive use, emotional disturbance, continued use despite negative consequences, interpersonal conflicts, and diminished quality of life) that resulted from an individual's particular Internet usage.

The term subtype refers to the classification of an individual's Internet use into one of the following categories: 1) Online communication (OC), 2) Online Sexual Gratification (OSG), 3) Online spending (OS), 4) Interactive gaming (IG), 5) Information searching (IS), and 6) Nonspecific. As Suler (1999) pointed out, each person has varying and individual needs that may require the use of different types of Web activities to satiate them. Therefore, the use of subtypes in this study was intended to account for those individual differences in Internet usage that may have been fostering the Online dependency.

OC describes users who spend the majority of their time Online emailing, instant messaging, or entering chat rooms. The usage does not distinguish between the nature of the Online communication—whether or not the usage is platonic, romantic or work-related in nature. OSG refers to users who spend the majority of their Online time accessing or downloading pornography, viewing or participating in virtual-sex websites, or any other sexually-related Web activity. OS refers to individuals who spend the majority of their time Online making purchases. These purchases are to include stock trading, gambling, music downloading, as well as buying products. IG refers to spending most Online time playing interactive computer games. This excludes games played against the computer. The games must involve at least one other individual. In addition to standard interactive games, the games may include fantasy football, poker, and blackjack. IS includes individuals who spend the majority of their time Online seeking information. The type of information they seek may include job searches, product searches, entertainment searches, news searches, sports searches, and academic searches. Finally, Nonspecific includes users who do not spend the majority of their time Online doing one specific activity. Rather, their time is divided equally among multiple activities.

### *Hypotheses*

The OUI was intended to improve upon the shortcomings of existing inventories and yield statistical findings that may be useful to the mental health field. This inventory varies from others in that it refrains from the limiting "all-or-none" criteria observed

in previously mentioned True/False questionnaires, such as Young's (1996) Internet addiction checklist. This scale also attempted to avoid one of the limitations observed in Griffiths' (2000) technological addiction theory by assessing the range of effect Internet usage has on the individual with the HOU-ODD continuum. Furthermore, the OUI was in part inspired by Davis' (2001) specific pathological Internet use theory as it accounts for the addictive nature of certain Web activities through subtype indicators of Online dependants. In keeping with Hall and Parsons' (2001) position, the scale was designed to account for the person holistically by integrating cognitive, behavioral, and emotional attributes of addiction symptomatology.

It was hypothesized in this study that Exploratory Factor Analysis of the HOU-ODD continuum would produce a three-factor solution reflecting the constructs from which the items were developed—cognitions, emotions, and behaviors—as they relate to addiction to the Internet. Second, it was expected that there would be a significant positive correlation between the HOU-ODD continuum and the BIS-11 and PHQ-9, and a significant negative correlation between the HOU-ODD continuum and the SWLS. In other words, those who score high on the HOU-ODD continuum should also score high on impulsivity and/or depression measures, and score low on satisfaction with life measures. Third, a significant positive correlation between the HOU-ODD continuum and the OUI subtypes—IG, IS, OC, OS, and OSG—was anticipated. Fourth, a positive correlation was expected between the scores on the HOU-ODD continuum and the amount of time people spent on the Internet, how many days of the week they accessed it, and the number of hours per day using the Internet. In the analysis of group differences, age rather than gender was expected to differ significantly in the OC subtype. The OSG and OS subtypes were expected to demonstrate group differences in both gender and age. And lastly, the two subtypes without expected group differences in age and gender were IG and IS.

## Method

### *Participants*

This study consisted of 143 female and 60 male psychology students (111 undergraduate level, 69 master level, 27 doctoral level) from two local universities in Miami, Florida. The mean age of participants was 29.95 ( $SD = 9.72$ ). The ethnic composition of this sample was 138 Hispanic, 24 White, 17 black, 4 biracial, and 20 unknown. Over 39 % of these individuals were single, 34 % were married, 10.3 % were divorced, 8.4 % had a live-in partner and 1 % were involved in a relationship (6.9% unknown marital status). The average reported amount of days spent on the Internet was 4.28 days per week ( $SD = 2.05$ ). In addition, these individuals indicated that they spent over 50 percent of their computer time accessing the Internet ( $M = 54.44$ ,  $SD = 34.85$ ).

Participation was on a voluntary basis and all individuals were treated in accordance with the "Ethical Principles of Psychologists and Code of Conduct" (American Psychological Association, 1992).

### *Instruments*

The Patient Health Questionnaire-9 (PHQ-9) is a 9-item self-report measure of depression from the PRIME-MD diagnostic instrument for the assessment of mental disorders, which corresponds with DSM-IV diagnosis for Major Depression (Kroenke, Spitzer, & Williams, 2001). It is scored on a scale from 0 (Not at All) to 3 (Nearly Every Day). A total score greater than five suggests evidence of Major Depression.

The Barratt Impulsiveness Scale-Version 11 (BIS-11) is a 30-item research instrument devised to measure impulsivity with respect to three subfactors, Non-planning, Motor Impulsiveness, and Cognitive Impulsiveness, as well as a Total Impulsiveness score. It is arranged in Likert format ranging from 1 (Rarely/Never) to 4 (Almost/Always); thus, higher scores reflect a higher degree of impulsivity, and it includes 11 reverse-score items to control for response sets (Patton, Stanford, & Barratt, 1995). For purposes of this study, only the Total Impulsiveness score will be used for comparison.

The Satisfaction With Life Scale (SWLS) is a 5-item scale that measures global life satisfaction. Items are scored in a range from 1 (Strongly Disagree) to 7 (Strongly Agree); thus, higher scores are correlated with a greater satisfaction with life.

The Online Usage Inventory (OUI) was utilized as a measure of Internet use. The preliminary scale consisted of 118-items arranged in Likert format, ranging from 1 “Strongly Disagree” to 5 “Strongly Agree”, with the option of 0 “Does Not Apply”. Construction of the items first involved identifying the primary purpose of the test (Internet addiction). Next, a domain sampling approach was used to reflect existing item domains for addiction. The 51 items in the HOU-ODD continuum were categorized as “cognitive”, “emotional” or “behavioral” to reflect the holistic nature of Online usage. For the subtypes, items were developed specifically to reflect existing Online demographics and current theories, which resulted in IG (13 items), IS (13 items), OSG (13 items), OC (14 items), and OS (14 items). All items were then arranged in random order to constitute the 118-item instrument.

#### *Procedure*

The test was administered in classroom settings at Carlos Albizu University and Miami Dade Community College. The students were offered to participate on a volunteer-basis and were provided informed consents to document their acknowledgement of the nature of the research, the option to withdraw at anytime without penalty, that there are no foreseeable risks, and that their name would not be associated with their responses. After the informed consents were signed and collected, students were given the test. The instructions on the test packet were read to the participants. The tests were then collected for further analysis.

Using SPSS 12.0 for Windows, the scores from the tests were entered and reliability analyses of the scales and items were conducted to determine internal consistency; any item that yielded a correlation coefficient of less than 0.2 was not considered an adequate item and was eliminated. Also, the scales were expected to reflect a minimum coefficient alpha of .70. Concurrent validity was measured to assess the correlation between high scores on the HOU-ODD continuum and high scores on the OUI subtypes, as well as to determine the extent of convergent validity between the OUI and the BIS-11, PHQ-9 and the SWLS. Independent sample t tests were conducted to test for significant differences between the OUI subtype scores and gender (60 males, 143 females), and OUI subtype scores and age. To differentiate between young adults and adults, age 30 was determined as the cut-off. Given that the sources for Web demographics and usage trends referenced in this research routinely categorized young adults as those under age 30 (Pew Internet & American Life Project, 2000; Lenhart, Rainie, & Lewis, 2001; O’Toole, 2003), it was necessary to remain consistent with that when establishing hypotheses based on such data. Of the respondents who indicated their age, 80 of them were over age 30 and 115 were under age 30. Effect size was then measured using Eta Squared in order to determine what proportion of the variance in the subtype scores were accounted for by age or gender. Exploratory Factor Analysis (EFA) was used to measure construct validity by analyzing how well the HOU-ODD continuum reflected the theoretical constructs cognitions, emotions, and behaviors.

### Results

#### *HOU-ODD Continuum*

A reliability analysis was conducted on the HOU-ODD continuum of the OUI to determine its internal consistency. Any item with an item-total correlation coefficient of less than .2 was removed. Preliminary analyses of the HOU-ODD continuum identified two items (reverse score) that were below the .2 cut-off point. After the elimination of these two items, the Chronbach’s alpha for the HOU-ODD continuum (49 items) was .93. Exploratory Factor Analysis was then conducted and the resulting reliability alpha post factor analysis was .94 (38 items).

Construct validity of the HOU-ODD continuum was then measured using Exploratory Factor Analysis on SPSS 12.0 for Windows. A three-factor solution was hypothesized since the items for the HOU-ODD continuum were constructed based on cognitions, emotions and behaviors as they relate to addiction to the Internet. Initial (unrotated) factor analysis of the 49-item HOU-ODD continuum yielded 14 factors with the eigenvalue of at least 1.0. The SPSS default is to retain factors with eigenvalues greater than one (George & Mallery, 2003), which coincides with Kaiser’s (1960) stopping rule that stipulates an eigenvalue of at least one is equal to the variance of one standardized variable (Grimm & Yarnold, 1995) and should be considered as a plausible factor. In

addition, the scree plot is further used for visual confirmation of how many factors to retain for rotation based on the eigenvalues (George & Mallery, 2003). Yet, as the scree plot indicated for the initial analyses of this study, a one-factor solution was implicated. Nonetheless, a three-factor solution was still explored based on the a priori criterion for this theoretical model. As such, an orthogonal solution was pursued with principal component factor analyses using a Varimax rotation and a forced three-factor solution. Despite the orthogonal rotation, multiple items loaded on more than one factor. A forced 2-factor principal component solution with Varimax rotation was then attempted since a high number of items were loading similarly on two factors. This, too, yielded statistically unimpressive factor loadings and theoretically indistinguishable factors. An oblique rotation (Promax) was then used to account for correlated factors, still using a 2-factor solution. This resulted in 7 items below a .3 factor loading and 8 items .3 and .4 factor loadings. Furthermore, the two factors remained theoretically indistinguishable with items that had no identifiable grouping. A one-factor solution was then explored.

For purposes of this study, items below a factor loading of .40 were eliminated. A principal component exploratory factor analysis, one-factor solution, yielded a total of 11 items loading below a .40. Once these items were eliminated, the exploratory factor analysis was conducted on the new 38-item HOU-ODD continuum. The item factor loadings ranged from .41 to .73. The resulting factor structure accounted for 31% of the variance among items and had an eigenvalue of 11.94. In addition, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) was a .90, which suggests the data can be explained by a common-factor model (Leong & Austin, 1996), Online Dependence. This coincides with the findings of other studies that suggested a one-factor solution could prove to be the most salient option for theoretical interpretation (Bowden, Fowler, Bell, Whelan, Clifford, Ritter, & Long, 1998; Erford, Bagley, Hopper, Lee, Panagopoulos, & Preller, 1998; Nelson, Rehm, Ustun, Grant, & Chatterji, 1999; Reilly & Eaves, 2000; Snell, Gum, Shuck, Mosley, & Hite, 1995).

Convergent validity was determined by assessing the correlation between the HOU-ODD continuum (Online Dependence) and the BIS-11 (impulsivity), PHQ-9 (depression), and SWLS (life satisfaction), given that impulsivity, depression, and poor life satisfaction were hypothesized in this study as co-morbid constructs of Internet addiction. Using SPSS 12.0, a bivariate correlation analysis yielded a statistically significant positive correlation between the HOU-ODD continuum and the BIS-11 ( $r = .235, p < .001$ ), and of the PHQ-9 ( $r = .334, p < .001$ ), which suggests that those who score high on the Online Dependence continuum also score high on impulsivity and depression (see Table 1). There was no significant correlation between the HOU-ODD continuum and the SWLS ( $r = -.104, p < .141$ ). Although, the SWLS did have a significant negative correlation with the BIS-11 ( $r = -.276, p < .001$ ) and with the PHQ-9 ( $r = -.413, p < .001$ ), which indicates that those who scored lower on life satisfaction tended to score high on impulsivity and depression.

In order to gain a more detailed understanding of the participants' computer usage, they were asked how many days per week they accessed the Internet, of these days per week, how many hours per day were spent Online, and finally, of their total computer usage, what percentage was spent Online. Bivariate analyses indicated a positive correlation ( $p < .05$ ) between the HOU-ODD continuum and the number of days per week the Internet is accessed ( $r = .346, p < .01$ ), the number of hours per day the Internet is used ( $r = .340, p < .01$ ), and the percentage of total computer time spent Online ( $r = .301, p < .01$ ). Meaning, those who score high on the HOU-ODD continuum are likely to access the Internet more days per week, more hours per day and their percentage of computer time Online is higher. In addition, those who reported a higher level of expertise were more likely to score higher on the HOU-ODD continuum ( $r = .175, p < .05$ ).

An independent samples t-test was conducted to determine if there was a significant difference between gender and HOU-ODD continuum scores, and age and HOU-ODD continuum scores. A significant difference was found in the HOU-ODD scores between males ( $M = 1.72, SD = .70$ ) and females ( $M = 1.51, SD = .66$ ) at the  $p < .05$  level ( $t(201) = 2.08, p < .039$ ). And, the effect

size was determined using  $\eta^2$  (.021). No significant difference was found in HOU-ODD scores between those under age 30 ( $M = 1.54$ ,  $SD = .65$ ) and those above age 30 ( $M = 1.63$ ,  $SD = .72$ ) at the  $p < .05$  level ( $t(193) = .870$ ,  $p < .385$ ). In addition, the effect size was determined through  $\eta^2$  (.012).

#### *OUI Subtypes*

Subsequent reliability analyses were conducted for each of the five OUI subtypes. Any item with an item-total correlation coefficient of less than .2 was removed. IS originally had 13 items. After eliminating one item, the reliability coefficient was .76 and the resulting number of items was 12. Both OC (14 items) and OS (14 items) had no item total correlation below a .2 and both yielded a reliability alpha of .79. OSG (13 items) yielded a reliability alpha of .84. IG had 13 items and yielded a reliability alpha of .87.

Additional correlations were conducted to measure the relationship between scores on the HOU-ODD continuum and the OUI subtypes. As hypothesized, there were significantly strong positive correlations between all five OUI subtypes and the HOU-ODD continuum: IG ( $r = .502$ ,  $p < .001$ ), IS ( $r = .685$ ,  $p < .001$ ), OC ( $r = .740$ ,  $p < .001$ ), OS ( $r = .565$ ,  $p < .001$ ), and OSG ( $r = .482$ ,  $p < .001$ ). These findings indicate that those who score high on the Online Dependence continuum are more likely to score high on the subtypes.

Each OUI subtype had positive correlations with the hours per day the Internet is accessed: IG ( $r = .502$ ,  $p < .01$ ), IS ( $r = .685$ ,  $p < .001$ ), OC ( $r = .740$ ,  $p < .001$ ), OS ( $r = .565$ ,  $p < .01$ ), and OSG ( $r = .482$ ,  $p < .05$ ). This suggests that the more hours per day accessing the Internet, the more likely a person is to score high on the OUI subtypes. Also, four out of five subtypes had a significant correlation with the percentage of total computer use spent Online: IG ( $r = .339$ ,  $p < .01$ ), IS ( $r = .331$ ,  $p < .01$ ), OC ( $r = .221$ ,  $p < .01$ ), and OS ( $r = .183$ ,  $p < .05$ ). Hence, those who score high on IG, IS, OC, and OS are more likely to spend more of their time using the computer on the Internet. There was no significant difference between OSG and percentage of Internet use on the computer ( $r = .114$ ,  $p < .123$ ). Therefore, those who Moreover, IG ( $r = .221$ ,  $p < .01$ ), IS ( $r = .262$ ,  $p < .01$ ), OC ( $r = .299$ ,  $p < .01$ ), and OS ( $r = .266$ ,  $p < .01$ ) significantly correlated with the number of days per week the Internet was accessed. Thus, individuals who scored high on IG, IS, OC, and OS, are more likely to spend more days per week Online. And, those who score high on OSG ( $r = .117$ ,  $p < .104$ ) are not more likely to access the Internet more days per week.

An independent samples t-test was conducted to determine if there was a significant difference between gender and scores, and age and scores in each subtype. As hypothesized, no significant difference was found in IG scores between males ( $M = 2.15$ ,  $SD = .71$ ) and females ( $M = 2.00$ ,  $SD = .65$ ) at the  $p < .05$  level ( $t(201) = .474$ ,  $p < .072$ ). This suggests that both males and females are likely to participate in interactive games. The effect size was determined through  $\eta^2$  (.016), and, no significant difference was found in IG scores between those under age 30 ( $M = 2.03$ ,  $SD = .71$ ) and those above age 30 ( $M = 2.00$ ,  $SD = .63$ ) at the  $p < .05$  level ( $t(193) = .272$ ,  $p < .786$ ). Therefore, the hypothesis that age does not affect IG scores was supported, but the hypothesis that there is no gender difference was not supported. In addition, the effect size was determined by  $\eta^2$  (.022).

As hypothesized, no significant difference was found in IS scores between males ( $M = 2.66$ ,  $SD = .72$ ) and females ( $M = 2.77$ ,  $SD = .82$ ) at the  $p < .05$  level ( $t(201) = .847$ ,  $p < .398$ ). In addition, the effect size was  $\eta^2 = .004$ , and, no significant difference was found in IS scores between those under age 30 ( $M = 2.75$ ,  $SD = .82$ ) and those above age 30 ( $M = 2.73$ ,  $SD = .76$ ) at the  $p < .05$  level ( $t(193) = .153$ ,  $p < .879$ ). Therefore, the hypothesis that age and gender do not affect IS scores was supported. Also, the effect size was  $\eta^2 = .008$ .

A significant difference was found in OC scores between males ( $M = 1.47$ ,  $SD = .53$ ) and females ( $M = 1.25$ ,  $SD = .56$ ) at the  $p < .05$  level ( $t(201) = 2.59$ ,  $p < .01$ ). In addition, the effect size was determined through  $\eta^2$  (.032). No significant difference was found in OC scores between those under age 30 ( $M = 1.33$ ,  $SD = .57$ ) and those above age 30 ( $M = 1.31$ ,  $SD = .54$ ) at the  $p < .05$  level

( $t(193) = .209, p < .835$ ). Therefore, the hypothesis that gender does not affect OC scores and age does affect the scores was not supported. In addition, the effect size was determined to be  $\eta^2 = .018$ .

No significant difference was found in OS scores between males ( $M = 1.53, SD = .63$ ) and females ( $M = 1.38, SD = .65$ ) at the  $p < .05$  level ( $t(201) = 1.53, p < .127$ ). Furthermore, the effect size was  $\eta^2 = .012$ . As hypothesized, no significant difference was found in OS scores between those under age 30 ( $M = 1.43, SD = .67$ ) and those above age 30 ( $M = 1.43, SD = .61$ ) at the  $p < .05$  level ( $t(193) = .002, p < .998$ ). Therefore, the hypothesis that gender would affect the OS scores was not supported, and the hypothesis that age would not affect the OS scores was supported. In addition, the effect size was determined through  $\eta^2 (.013)$ .

As hypothesized, a significant difference was found in OSG scores between males ( $M = 1.09, SD = .69$ ) and females ( $M = .79, SD = .69$ ) at the  $p < .05$  level ( $t(201) = 2.85, p < .005$ ). Also, the effect size was determined to be  $\eta^2 = .039$ , and, no significant difference was found in OSG scores between those under age 30 ( $M = .91, SD = .92$ ) and those above age 30 ( $M = .82, SD = .62$ ) at the  $p < .05$  level ( $t(193) = .916, p < .361$ ). Therefore, the hypothesis that age has no effect on OSG scores and that males would have significantly higher OSG scores was supported. Moreover, the effect size was  $\eta^2 = .017$ .

### Discussion

The purpose of this study was to develop an assessment tool that comprehensively measures Internet usage from healthy use to Online dependence. Specifically, the instrument was designed to assess the degree of effect Internet use had on the cognitions, emotions, and behaviors of an individual. Also unique to the instrument was its potential to recognize five pathological subtypes as they pertain to specific Web activities. The instrument developed was called the Online Usage Inventory (OUI) and it contained 2 major components. The first component was the continuum measuring Healthy Online Use to Online Dependence Disorder (HOU-ODD continuum). The second component consisted of the subtypes: Interactive Gaming, Information Searching, Online Communication, Online Spending, and Online Sexual Gratification. Originally, the HOU-ODD began as a 49-item instrument with a Chronbach's alpha of .93. However, after statistical analyses, the final 38-item HOU-ODD scale resulted in a Chronbach's alpha of .94, indicating a very high level of internal consistency. The 5 subtypes of the scale also reflected a satisfactory level of internal consistency, ranging from .76 to .87.

The HOU-ODD continuum was hypothesized to have a positive correlation with impulsivity and depression and have a negative correlation with satisfaction with life. The results indicated that there was a positive correlation between the HOU-ODD continuum, the impulsivity measure (BIS-11) and the depression measure (PHQ-9), yet there was no significant correlation with the life satisfaction measure (SWLS). Such findings suggest that those who scored high on the HOU-ODD continuum would also score high on depression and impulsivity. This confirms the theories and research put forth by Young and Rodgers (1998) and Hall and Parsons (2001) that there is co-morbidity amongst the three disorders.

The expectation that the more pathological the Internet use, the lower the quality of life for the individual (Charlton, 2002) was not supported in this study. This may be accounted for by the fact that those who use the Internet excessively consider their lives to be entirely satisfying as a result of their Internet use. Following the logic of Young's (1999) ACE model, it is conceivable that those who are using the Internet excessively may be creating an ideal persona through the Web's "anonymity", they may be prospering from the "convenience" of having Internet access, and/or they may be "escaping" from their life's difficulties; thus, a false perception of life satisfaction may be created. A possibility of measuring for this in future research would be to provide a similar life satisfaction scale and ask the participants to respond to the questions as if they had no access to the Internet.

As hypothesized, this study demonstrated significant correlations between the HOU-ODD continuum and all five subtypes. Moreover, the HOU-ODD continuum was found to have statistically significant correlations with the number of days per week the Internet is accessed, the number of hours per day spent Online, and the percentage of total computer usage spent accessing the

Internet. The OUI subtypes were found to have similar correlations, with exception of Online Sexual Gratification. There was a positive correlation between the number of hours spent Online, but not between the number of days per week spent Online or the percentage of computer time accessing the Internet. This may be explained by the fact that this population sample consisted mostly of Healthy Online Users. Therefore, a true representation of Online Sexual Gratifiers may not have been present.

Age and gender were analyzed with respect to the OUI subtypes. Also, expected age differences were modeled after the current population Web demographics used in developing hypotheses, therefore the cut-off age between young adults and adults was set at age 30 in order to maintain theoretical consistency.

In this study, it was hypothesized that there would be no significant difference between age and gender for Interactive Gaming and Information Searching, and an expected difference in gender (males) for Online Sexual Gratification. The hypothesis was supported by the results and concurs with current research and demographics. However, unexpected differences were found in the Online Communication subtype, whereby a significant difference was discovered between males and females and no significant difference was found in age. In this sample, males were shown to be the Online Communicators. Also, there was a correlation between high scorers of Online Communicators and Online Sexual Gratifiers, both males. It is possible that the Online Sexual Gratifiers spent their hours Online communicating in sex-related chatrooms or webcams and spent a limited time searching for and downloading sexual materials.

Also, there was no significant difference found in ages for Online communication, in that, those over age 30 communicated Online as much as those under age 30; this could be accounted for by the specific population found in a professional school for psychology. It was found that 49% of the participants over age 30 were married. By working full-time and going to school full-time, it is possible that they were utilizing the Internet as a convenient form of communication to keep in touch with family.

Finally, there was no significant difference found in age (as expected) and no significant difference found in gender for Online Spending. It was expected that males would spend more money Online, as represented by Web demographics. However, it is again possible that because this is a student population, many books were purchased Online by both males and females, thus evening out the gender divide. Clearly, these explanations are speculative and would necessitate further research for validation.

An Exploratory Factor Analysis was conducted to search for underlying constructs within the data. It was postulated that a three-factor solution would result since the items were constructed from cognitive, behavioral, and emotional domains as they related to addiction. However, it is known as a daunting endeavor in the field of psychology to find multiple factors, both prominent and relevant, that account for a major part of the variance (Aiken, 2003). The factor analysis for this study resulted in a one-factor solution. When forced into a three-factor solution, no factors made theoretical sense. The variance was best accounted for by one factor, Online Dependence (addiction). A possible explanation for this is the holistic nature of Online Dependence that has been so frequently referenced throughout this study.

#### *Current Benefits*

The OUI can currently be used to measure an individual's Internet usage. The results of the HOU-ODD continuum would indicate whether the usage is healthy or pathological. When deciding on a course of treatment, it is essential for clinicians to have a comprehensive understanding of the nature of the client's presenting issues. As shown by this study, those who have a higher score on the continuum may also suffer from depression or have poor impulse control. This would provide mental health clinicians greater insight into the potential co-morbidity. Also beneficial is the potential of identifying the Internet addiction subtypes. By isolating the Web activity that is perpetuating the addiction, treatment plans can be more appropriately and succinctly devised.

#### *Future Directions*

Being that this research has been a pilot study, it was beyond its scope to conduct follow-up analyses of the newly revised OUI scale. Therefore, it is necessary for this research to continue and re-test the reliability, validity and factor structure of the test. There are many findings that warrant a more substantial clarification with a more representative sample population. For example, it would be necessary to determine if the gender and age findings of the OUI subtypes would be different for a non-student population. Furthermore, the fact that the respondents of this survey were primarily Hispanic may have hindered the potential of being a true population representation. Therefore, finding a more ethnically balanced population sample may provide a baseline of comparison to this study. And, finally, given the increased presence of the adolescent Internet population, research should be conducted to analyze their uses.

Upon re-examination, implementing greater control for a response set is warranted. Quite often participants become accustomed to responding in the same fashion for each item if they appear similar. Therefore, by increasing the number of reverse-score items, participants are more likely to respond to each item with a greater degree of attention.

Long-term outcomes of this research may be to eventually provide a personality profile for each of the OUI subtypes. This would provide immeasurable advantages to the field of mental health in treating Online dependants by incorporating treatment planning specific to the different personality types. Moreover, the study of each personality type and the specific Internet activities more frequently used could eventually lead to the identification of personality predispositions for Online Dependence.

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