

Compulsive Internet Use in Adults: a study of prevalence and drivers within the current economic climate in the UK

Abstract

Compulsive Internet Use (CIU) refers to a maladaptive relationship with the tool, including a loss of control over the use, the use for mood change and withdrawal symptoms. Most studies have relied on student samples, thus little is known about its prevalence in adults. The first objective of this study was to examine CIU in adults that were either employed (N=260) or unemployed within the last year (N=256). Second, the drivers of CIU were examined, with a focus on attitudes that reflected the reality of long working hours and job insecurity that people experience in current workplaces. A high risk of CIU (63%) with no significant differences between employed and unemployed individuals was found. However, unemployed individuals were in the highest band of Internet use, a risk factor for CIU. Interestingly, unemployed 40-55 years old females experienced higher CIU than their male counterparts. Regarding drivers of CIU, the job attitudes working excessively and compulsively were the strongest predictors, beyond emotion stability. This was particularly true at high levels of social support. In view of this, organizations should proactively evaluate the risks associated with encouraging working excessively as ill-health consequences associated with CIU could outweigh the benefits.

Key Words: Compulsive Internet Use, Internet Addiction, Problematic Internet Use, Technophiles, Workaholism, Physiological Adaptation

Introduction

In the twenty-first century, the Internet supports all areas of human interactions. It is used for entertainment purposes, people maintain their friendships through social networks and it directly or indirectly affects most work processes. In this context, the Internet has become a 'universal enabler' of everyday life. However, the omnipresence of this phenomenon could have a double-edged sword impact in people's lives. For instance, emails enable efficient, instant, borderless communication with agents within and outside the organization. Nevertheless, Marulanda-Carter and Jackson's simulation study (2012) revealed

that interruption due to constant emails caused individuals to take one-third longer to complete tasks. Alongside the links between technology and productivity, researchers have turned their attention increasingly to this phenomenon's impact on well-being. Evidence suggests that some individuals can lose control over the use of the Internet, and this negatively interferes with core aspects of their lives both in the short term (e.g., increased levels of stress at work, diminish work life-balance); and the long term (e.g. social isolation, depression and anxiety). This maladaptive use of the Internet has been coined as 'Compulsive Internet Use' (CIU). Because of the high reliance that individuals have on this tool, researchers are faced with the challenge of identifying risk factors that make individuals vulnerable to develop a pattern of problematic usage.

The economic crisis in the Western world has led to organizations searching for efficiency in utilizing resources (Datta et al., 2010). This has resulted in high employment insecurity. For those who remain in employment, excessive workloads and long working hours are common in the technology driven workplaces (Young, 2010). In this context, the authors of this paper believe that job attitudes and associated behaviors (i.e. working compulsively and working excessively) will be key drivers of maladaptive Internet use. Further, the role of socio-demographic variables related to the world of work (employed vs. unemployed), and life-style factors (i.e. hours of usage and main source of social support), are also expected to be key factors to understand compulsive Internet use. In this paper the prevalence of compulsive Internet use, and its predictors with a working age population, balanced in terms of gender and employment condition, will be examined. This is expected to overcome the excessive focus on young samples. Second, the authors move beyond distal drivers of compulsive Internet use which other studies examine, and focus on the job related drivers in line with the salience that employment has acquired in today's society for individuals' identity and well-being.

1 Compulsive Internet use: definition, dimensions and prevalence

Scholars initially coined the excessive use of the Internet and the loss of control over its use as 'Internet addiction', due to its similarities with substance abuse problems (Young and Rogers, 1998). However, the term addiction has strong connotations of physiological adaptation, a key feature of substance-based addiction that behavioral ones do not share (e.g. Griffiths, 2000, 2010). Meerkerk et al. (2010) adopt the term Compulsive Internet Use in order to reflect the behavioral aspects that substance and non-substance addictions share (i.e.

loss of control and conflict). The authors define it as ‘the pattern of Internet use characterized by loss of control, preoccupation, conflict, withdrawal symptoms, and use of the Internet as a coping strategy’ (Meerkerk et al., 2010: 729). The American Psychiatric Association has not included compulsive Internet use in its *Diagnostic and Statistical Manual of Mental Disorders* (DSM IV), yet various authors have recommended its inclusion in future publications (Block, 2008). Without a formal diagnostic criterion, Young and Rogers (1998) adapted the DSM IV criteria for impulse control disorders, since these also involve a failure to control behavior despite the negative consequences. Similarly, Meerkerk et al. (2010) develop their diagnosis tool based on pathological gambling, a specific impulse control disorder. On the other hand, Griffiths (2000) built on previous work on a range of behavioral addictions and conceptualizes compulsive Internet use as a subcategory within this group. They all highlight that compulsive Internet use includes salience of the Internet as it becomes central to the person’s life; mood change related to the use; loss of control over the use; withdrawal symptoms; conflict and tolerance. Griffiths (2000) and Young and Rogers (1998) also refer to a dimension of relapse (i.e. re-establishing behavior even when one stops it for a long time).

These dimensions have informed the development of diagnosis tools and evaluation of prevalence of addiction in various countries which have been primarily focused on teenage populations (e.g. Balakrishman and Shamim, 2013; Niemz et al., 2005). In the UK, Niemz et al. (2005) reported that 18.3% experience pathological Internet use; however, Kuss et al.’s recent study (2013) found only 3.2% of prevalence in the same country using a clinical diagnostic tool that derives from the diagnostic criteria for substance dependence. Young individuals are more vulnerable to different addiction agents, thus we cannot generalize prevalence to the general population (Byun et al., 2009). Further, there are limited studies with adult samples and some of these do not include prevalence figures (Buckner et al., 2012; Meerkerk et al., 2010). The first survey conducted with a large American sample reported around 6% of compulsive Internet use (Greenfield, 1999). More recently, Lu et al. (2011) reported prevalence around 30% in Japanese employees. In a study with German individuals prevalence was around 14.4% (Montag et al., 2010). To the authors’ knowledge, there are not any current prevalence figures of individuals in employment age in the UK. Establishing prevalence is important as evidence suggests that compulsive Internet use results in depressive symptoms, loneliness, low self-esteem, anxiety and physiological symptoms (Caplan, 2002). Specifically on working age samples, excessive Internet use leads to

information fatigue syndrome (i.e. information overload), high cognitive costs and emotional stress, chronic insomnia, relationship problems and burnout (Kakabadse et al., 2000; Marulanda-Carter and Jackson, 2012; Young, 2010). In short, the high presence of the Internet in our working and social lives and the negative consequences justify the need to understand the construct's prevalence and its drivers.

2 Drivers of compulsive Internet use: theoretical model

Davis (2001) explores the drivers of problematic Internet use from a cognitive-behavioral perspective and distinguishes between proximal and distal Internet drivers. Distal drivers refer to the necessary condition for the problem to arise, but on their own are not sufficient to cause compulsive Internet use. In the original model an underlying psychopathology is a pre-requisite for the maladaptive use to develop and is therefore conceptualized as a 'distal' driver. Conversely, the proximate drivers are enough to produce the problem on their own and are closely linked to the cognitive-behavioral manifestations of compulsive Internet use. In Davis's (2001) model, proximal drivers are distorted cognitions that result from the interaction between the underlying pathology and the exposure to technology. It is argued that the necessary condition of an underlying pathology leads to a rather limited view that could leave the development of compulsive Internet use in healthy individuals unexplained. Thus, the model tested in this paper builds on the distal versus proximal drivers' concept, but shifts the focus to the study of individual and situational drivers without the pathology pre-requisite. This may lead to the identification of drivers with greater explanatory power for the wider population.

2.1 Distal drivers

Distal drivers, refer to those variables that have been related to compulsive Internet use, yet on their own are not enough to cause the condition (Davies, 2001). In early studies, researchers suggested that high Internet use was an obvious indicator of the problem (Greenfield, 1999). With the advancement of studies in compulsive Internet use, scholars have conceptualized the latter as a more complex phenomenon with dimensions that mirror other behavioral addictions including withdrawal, conflict and loss of control. Notwithstanding, spending a high number of hours is conceptualized as a proxy of compulsive Internet use, and there seems to be a strong positive correlation between these variables (Chou and Hsiao, 2000). This is understandable since spending long hours on the Internet will leave little time for offline interpersonal relationships, which could lead to

conflict, a key dimension of compulsive Internet use. Nevertheless, high usage might result in positive outcomes under specific life circumstances. For example, studies have found that high engagement in online gaming in older adults result in better well-being than older adults who did not play (Allaire et al., 2013). Thus, high usage seems to be a necessary yet not sufficient cause for compulsive Internet use thus, it is hypothesized as a distal driver.

The economic crisis has contributed to a highly unstable employment landscape, with many people experiencing job loss or struggle to access the job market following graduation (Datta et al., 2010). For those who either lost their jobs or struggle to access the job market for the first time, the Internet has become a central tool to locate job opportunities. In Kakabadse's qualitative study (2007), unemployed individuals were more likely to spend more hours on the Internet. Although it cannot be hypothesized that unemployed individuals are going to experience a higher level of compulsive Internet use, it is expected that they engage in significantly more hours outside work than those in employment.

Hypothesis 1 Unemployed individuals spend significantly more hours of Internet usage than those in employment.

In a society that spends increasingly more time online, more of our social support is obtained through online encounters (Ryan and Xenos, 2011). In online interactions deception is likely to appear and there is a high risk of misunderstanding due to the lack of visual contact (McEwan and Zanolla, 2013). Thus, in spite of the high number of social interactions, individuals may not enjoy the advantages of meaningful social support that come from face to face interactions (Sheldon, 2013). Empirical evidence is not conclusive in this area. On the one hand, some have found that online support works as a healthy alternative to those dissatisfied with their offline social support (Chung, 2013). On the other hand, researchers have found that preference of online interaction over offline is a main driver of problematic Internet use (Caplan, 2003, cited in Chung, 2013; Kuss et al., 2013). Further, in Iacovelli and Valenti's experiment (2009), normal users maintained telephone conversations with excessive users. The researchers found that the excessive users had lower social skills in terms of establishing rapport and likeability than normal users. Additionally, Chung (2013) found that those individuals who use online support groups for health purposes spend twice the time compared to those who did not. In view of these findings, when your main source of social support is virtual, there is a potential risk of developing compulsive Internet use yet this is not enough to produce it on its own. Thus, this variable is conceptualized as a distal

driver.

Hypothesis 2 Those for whom the main source of social support is virtual are more likely to experience compulsive Internet use than those whose main source is face to face.

Previous studies seem to suggest that Internet addiction is highly prevalent among college students and the young population. This vulnerability to develop compulsive Internet use among teenage groups could potentially be stronger than other substance-based addictions. Thus, Kakabadse (2007) found that young respondents reported technology as an object of addiction significantly more than they report smoking or gambling. In view of this, we expect that the younger groups in our sample will report higher levels of compulsive Internet use than the older groups. In a previous quantitative study, Meerkerk et al. (2010) found no significant impact on the average age on whether individuals were compulsive or not compulsive Internet users. It is expected that Internet usage differences probably occur when different age groups are formed.

Hypothesis 3 There will be significantly more compulsive Internet users among the younger groups than among the older groups.

Qualitative and quantitative studies have found that males are more likely to develop maladaptive Internet use patterns than females (e.g., Kakabadse, 2007). On the other hand, some studies suggest that if compulsive Internet use was narrowed down to the type of activity that one performs online, these gender differences would not be as 'clear-cut' as they seem. Thus, McAndrew and Jeong (2012) found that females tend to use Facebook more often, have more Facebook friends and work on their profile pictures to display an acceptable impression more so than males. In view of the novelty of the topic, and the lack of consistency in the operationalization, there is not enough information to draw a hypothesis regarding the different impact of gender. Notwithstanding, gender could be a stronger predictor of compulsive Internet use when examining the interaction with age. In a study with college students exploring the overlap of common substance and behavioral addictions, young males scored a higher level of addiction on alcohol, smoke, gambling and Internet use than females (Greenberg et al., 1999). Similarly, Henle and Blanchard (2008) also found that young males were more addicted to the Internet than young females. Further, Kakabadse (2007) found that young and unemployed males reported an addiction to the Internet more frequently than females. Based on this finding, and in line with the employment focus introduced in this study, the interaction between gender, age and employment conditions as a

distal predictor of compulsive Internet use will be tested. Thus:

Hypothesis 4 There is a significant interaction effect between employment conditions, gender, age and compulsive Internet use. In particular, unemployed, young and male participants will score significantly higher levels of compulsive Internet usage.

Researchers have also associated individual differences with compulsive Internet use. In Meerkerk et al.'s (2010) study, impulsivity and high sensitivity to punishment were compulsive use predictors. High sensitivity to punishment is conceptually related to low emotional stability (i.e. neuroticism), and other studies have revealed significant correlations between compulsive Internet use and neuroticism (e.g. Montag et al., 2010). Based on this, the association between emotional stability and compulsive Internet use is expected. However, emotional stability is conceptualized as a distal factor since evidence is not consistent enough to consider this personality trait as a sufficient condition. Thus, in Buckner et al.'s study (2012) with working adults, low emotional stability was not significant in predicting compulsive Internet use.

Hypothesis 5 Emotional stability is positively correlated to greater Compulsive Internet Use

2.2 Proximal drivers

Proximal drivers are those factors in the etiological continuum closer to the compulsive Internet use symptoms. These are strong drivers that could themselves produce compulsive Internet use (Davis, 2001). Within a highly technology-driven work context, specific work attitudes can be conceptualized as proximal drivers. Griffiths (2010) cites long working hours as one of the main triggers of technology abuse. Working long hours, beyond what is expected in order to meet reasonable work goals is a central element of 'workaholism' (e.g. Porter and Kakabadse, 2006). In addition to working excessively, Oates' original definition also suggests a compulsive way of working in that there is an 'uncontrollable need to work incessantly' (1971: 11). Based on this, researchers commonly conceptualize workaholism in terms of two dimensions. These are a cognitive dimension of obsession with work or 'working compulsively' and a behavioral dimension of 'working excessively' (e.g. Schaufeli et al., 2009). In Davis' (2001) model the main addiction predictors are distort cognitions. Workaholism involves distort cognitions and associated behavioral responses to the extent to which the individual fails to identify a reasonable stop to his/her work. For the majority, working compulsively and excessively involves using

technology and the Internet in a similar maladaptive manner (Porter and Kakabadse, 2006). This link between addiction to work and addiction to technology could mirror other patterns of compulsive behaviors. Thus, heavy smokers tend to drink more tea or coffee (Peele, 1989). In short, workaholism is expected to be a key driver of compulsive Internet use.

Hypothesis 6 Working compulsively is positively associated with compulsive Internet use beyond emotional stability.

Hypothesis 7 Working excessively is positively associated with compulsive Internet use even when controlling emotional stability.

2.3 Moderator role of social support and life satisfaction

Researchers have associated social support with higher adherence to treatment and as a protector against dispositional vulnerability in the addiction literature (Young and Rogers, 1998). Further, it is a buffer of various stressors on individuals' well-being (Schwarzer and Knoll, 2007). Since workaholism is expected to be a major driver of maladaptive Internet use, enjoying social support could prevent individuals who work excessively and compulsively to develop the disorder. On the other hand, within a working environment that encourages long working hours, working excessively may carry positive financial rewards and non-financial advantages such as satisfaction with life (Bonebright et al., 2000). Thus:

Hypothesis 8 A higher level of life satisfaction weakens the relationship between workaholism and compulsive Internet use.

Hypothesis 9 A higher level of social support weakens the relationship between workaholism and compulsive Internet use.

Please insert Figure 1

3 Methods

3.1 Procedure and participants

Data was gathered through an online survey and participants from a market research panel (N=516) between the ages of 18-65 were selected to participate (M= 41.7, SD= 14.5). The authors also ensured that the sample was balanced in terms of gender (male=259, female=257) and employment (employed=260, unemployed=256). Unemployed individuals were selected to participate if they had been unemployed for up to twelve months. Regarding

their level of education, 9% had some type of postgraduate qualification, almost 20% of the sample had a first degree, around 9% held Higher Education diplomas, and 20% held qualifications required to access an undergraduate degree in the UK (i.e. A Levels). The rest of the sample had professional qualifications and high school diplomas and only 6.6% had no qualification). Employed respondents spent an average of 5 hours per day on the Internet of which 3.2 (SD=2.3) hours were outside work, and 1.8 (SD=1.6) at work (for private purposes). Unemployed participants spent an average of 4 hours a day (SD=3.1) on the Internet. Among the online activities, we asked the respondents to report what they spent the most time on. The highest frequencies of responses were general browsing, followed by social networking and email.

3.2 Survey design

The scales used to operationalize each variable of study were chosen because of their high validity and reliability in previous studies. Where different scales with similar validity and reliability were available, the one with the lower number of items was chosen to reduce the questionnaire length. The survey also included socio-demographic variables (gender, age, job occupation, highest qualification achieved) and some ad-hoc questions that could be related to compulsive Internet use (i.e. the type of Internet use for personal purposes, and activities in which they engage while online). Furthermore, based on the high level of comorbidity reported in problematic Internet use (Block, 2008), there was a yes or no question to enquire about whether users were addicted to three main sub-types of Internet addiction (i.e. sexually-based experiences, gaming and email) and the most common substances and activities cited in the literature (shopping, gambling, virtual world, social media, Internet and/or surfing, drugs, alcohol). Finally, since a high level of virtual friendship has been related to maladaptive Internet use (Chung, 2013), we also asked questions regarding social support with a distinction between virtual (defined as those that you have met online and never face to face) and non-virtual (defined as those that you have met face to face).

3.2.1 Scales

The Compulsive Internet Use was measured with Meerkerk et al.'s (2010) scale because it has been developed specifically for this construct, and there is sound evidence of the scale's reliability and validity. The fourteen item scale provides an overall index of compulsive Internet use and is made of five sub-scales that represent the critical components of the maladaptive use. These components are withdrawal symptoms (e.g. How often do you

feel depressed or irritated when you cannot use the Internet?), loss of control (e.g. How often do you find it difficult to stop using the Internet when you are online?), preoccupation (e.g. How often do you think about the Internet, even when not online?), coping (e.g. How often do you go on the Internet when you are feeling down?), conflict (e.g. How often do others (e.g. partner, children, parents, friends) say you should use the Internet less?). The original scale did not contain any items about tolerance, however; various behavioral addiction researchers have stressed the need to evaluate this element (e.g., Griffiths, 2000). In line with Block's (2008) suggestion, tolerance was defined as the user's need for more hours of Internet use or the constant need for better equipment (items were: 'How often do you feel the need to engage more intensively (e.g. more hours, more variety) in your favorite online activities? How often do you feel the need for better equipment or more software?') The internal consistency of the scale with the new items was .94. Confirmatory factor analysis for this construct with the two new items revealed that the one-dimensional structure remained.

Emotion stability was measured with a brief two-item measure of Ten Item Personality Inventory (Gosling et al., 2003). Although the psychometric properties are inferior to longer versions, the authors report adequate levels of convergence with other Big Five measures, test-retest reliability. Cronbach's alpha for emotion stability was .61. Items are rated on a 7-point Likert scale (1=strongly agree, 7=strongly disagree). A sample item was 'I see myself as anxious, easily upset.' Workaholism was measured with Schaufeli et al.'s (2009) scale. The scale measures two dimensions: working excessively and working compulsively and consists of five items each. Schaufeli et al. (2009) developed the construct based on two existing scales of compulsive tendencies and drive. They later refined and shortened the scale to comprise 10 items. The 4-point Likert scale goes from 1=never to 4=almost always. A sample item for working excessively was 'I seem to be in a hurry and racing against the clock' and for working compulsively 'It's important for me to work hard even when I don't enjoy what I'm doing.' Cronbach's alpha were .73 for working excessively and .79 for working compulsively. Social support was measured with Rena et al.'s (1999) five item scale. The 5 point Likert scale ranges from 1=never to 5=very often. The instructions were 'How often is each of the following kind of support available to you if you need it?' A sample item was 'Someone to confide in or talk to about your problems.' Cronbach's alpha was .86. Finally, life satisfaction was measured with Pavot and Diener's scale (1993). It consists of 5 items and the response scale goes from 1=strongly disagree to 7=strongly agree. A sample item was 'In most ways, my life is close to my ideal.' Cronbach's alpha was .89.

3.3 Statistical analyses

The cut-off point of compulsive versus non compulsive Internet users was estimated, and the impact of socio-demographic variables on the two levels of compulsive Internet use was tested. Then, Structural Equation Modeling was used because this method allows testing the hypothesized relationships in the model of study simultaneously. The model testing involves two phases: testing the measurement model (i.e. confirmatory factor analyses and estimating the constructs' validity and reliability) and testing the structural model (i.e. where the actual paths between exogenous and endogenous variables are tested) (e.g. Kline, 2005). Model parameters were estimated with Maximum Likelihood and AMOS 20. Various goodness of fit indices to assess the model's fit were chosen: chi-square statistic divided by the degrees of freedom (χ^2/df^2), the comparative fit index (CFI), goodness of fit index (GFI), the incremental fit index (IFI) and the root mean square error of approximation (RMSEA). The χ^2/df ratio must be below 3, the values of CFI, GFI, IFI should be above .9 and the value of RMSEA below .08 (e.g. Carmeli et al., 2009). Finally, moderation effects were tested with hierarchical regression analysis (Hypotheses 8 and 9).

4 Results

4.1 Descriptive statistics and socio-demographic analysis

First, the percentage of compulsive Internet users following Meerkerk et al.'s (2010) recommendation was estimated. The authors suggest that compulsive Internet users are likely to score the behavior represented in the questions of the scale on average more than sometimes (i.e. 2). Since there were 16 items, the cutoff point was >32. Precisely 63.4% of the participants (N=367) were within the compulsive Internet use category. No gender differences in compulsive use were found, but females scored significantly higher in items of using the Internet for mood change (items 12, 13). Average scores of neuroticism and Internet usage per day outside work were higher for compulsive Internet users; whereas, life satisfaction was significantly lower and no significant differences in social support were found. Both working compulsively and working excessively were significantly higher for compulsive Internet users. Those that reported behavioral addictions were more likely to fall in the compulsive users' category.

Please insert Table 1a and 1b

Cross tab analysis with chi-square omnibus test and post hoc evaluation of adjusted standardized residuals for each cell were performed to test Hypotheses 1-3. Even though

there were more employed individuals in the compulsive user category, these differences were not significant. However, unemployed individuals were more likely than employed to spend 6-9 hours of Internet usage a day. This confirms Hypothesis 1. Compulsive Internet users were more likely to use virtual social support than non-compulsive users; whereas, the latter were more likely to have face to face friends as a main source of social support. This confirms Hypothesis 2. The average age of compulsive Internet users was lower than non-compulsive users ($\bar{x}=38.8$ vs. $\bar{x}=46.7$). Furthermore, younger groups (18-24 and 25-34), displayed more individuals in the compulsive Internet use category than expected by chance; whereas, the opposite applied to the oldest group (55-65) which confirms Hypothesis 3. Finally, ANOVA analyses were conducted to test the three way interaction between employment condition, gender and age (Hypothesis 4). Only age and the three way interaction were significant. In order to aid interpretation, and since there was a balanced sample in terms of employment, a two-way ANOVA with a split sample based on employment was run. The interaction gender and age was not significant for the employed group; whereas, there was a significant interaction in the unemployed group. As Figure 2 indicates, there are two points at which the difference in means could be significant. These are the 18-24 group, when men scored significantly higher levels of compulsive Internet use and the 45-55 group with females scoring higher levels than male; however, differences were only significant in the latter group (Mean difference=.543; $p=.025$). Finally, stepwise regression analysis was used to examine the antecedent role of the main activity that users engage online and found that flirting online and sexting were the activities that explain the highest variance of compulsive Internet use ($r=.244, p<.001$) followed by video-surfing, blogging, email, online gaming and social networks.

Please Insert Figure 2

4.2 Structural Equation Modeling analysis

The preconditions for Structural Equation Modeling were tested prior to examining the model fit. First, the sample size was largely above the minimum recommended of 200 cases, or 15 cases per variable. Second, bivariate correlation between the variables of study revealed coefficients between .11 and .40, hence the values were below the severe multicollinearity threshold of .70 (Tabachnik and Fidell, 2001). Then, normality was checked. Although univariate normality was mostly supported, the data violated multivariate normality. In these common situations, the use of the bootstrap resampling method to

estimate model parameters has been recommended and it was followed in this study (Nevitt and Hancock, 2001). The measurement model was tested prior to the structural one (Kline, 2005). Here, the relationships between constructs were nondirectional, and each latent variable had two to five indicators (items of the scale), except for compulsive Internet use. Since this construct had more than double the amount of indicators than the other latent variables, made five item parcels were made estimating the means or conceptually related items based on the theoretical dimensions of compulsive Internet use. First, the overall model achieved good fit (see Table 3). Then, the scales' factorial structure was examined (see Table 2). All factor loadings had a significant weight in relation to their latent variable ($p < .05$) and all loaded .5 or over in the expected factor except for Item 1 working excessively and Item 10 working compulsively, which was omitted from the analysis. Two measures of construct validity were assessed: construct reliability and average variance extracted. Construct reliability was above the recommended between .7 and .9 (Fornell and Larcker, 1981) except for emotional stability (.65). The average variance extracted was close or above .45. This was the recommended threshold to support the constructs' convergent validity (Fornell and Larcker, 1981) except for WE (AVE=.33). Here, two items with low factor loadings were deleted which improved the construct's reliability and validity.

Please insert Table 2

The structural model was tested subsequently. In line with a previous study, emotional stability was significantly related to compulsive Internet use in the path analysis (Hypothesis 5). However, working compulsively and excessively were stronger predictors of the syndrome (Hypothesis 6 and 7 confirmed) even when controlling for emotional stability. Finally, also it was also found that working excessively was positively related to life satisfaction; whereas, working compulsively was negatively related.

Please insert Table 3 and Figure 3

4.3 Moderation analysis

In order to test Hypotheses 8 and 9 moderation analysis with hierarchical regression analyses were conducted. There was not a significant interaction of life satisfaction on the association between workaholism and compulsive Internet use, thus Hypothesis 8 was rejected. In contrast, a significant interaction of social support on the relationship between working excessively and compulsive Internet use was found. At low levels of working excessively (the independent variable), high social support worked in the expected way. Thus

it led to lower compulsive Internet use. However, at high levels of working excessively, high social support had the opposite effect. Thus, high social support led to higher compulsive Internet use than low social support. Hence, Hypothesis 9 is not fully supported.

Please insert Table 4 and Figure 4

Please insert Table 5

5 Discussion

5.1 Summary of findings and contributions

The study of compulsive Internet use has been focused on young segments of the population so far, and there are a limited number of studies using path analysis which allow testing the role of different variables simultaneously. In this study, these gaps were addressed by using a sample of working age individuals in order to provide a representative prevalence figure. Furthermore, the impact of macro-economic variables on individuals was also considered, by attending to their employment conditions. Descriptive analysis evidenced a high proportion of individuals with a compulsive Internet use in a sample that had an average of 41.7 years old. These figures suggest that compulsive Internet use is not just a risk for young individuals. Flirting online was the main online activity associated with compulsive Internet use, which supports previous findings (Chou and Hsiao, 2000). Finally, a confirmatory approach was used to test the theoretical framework for compulsive Internet use development with a specific emphasis on analyzing the cognitive-behavioral proximal drivers. This enhanced more restricted models found in the literature (Davis, 2001).

In line with our conceptualization of distal drivers as those not sufficient to explain compulsive Internet use, gender on its own was not a predictor of the maladaptive use. However, this variable's role was appreciated with a more detailed analysis. Thus, women scored higher in one dimension of compulsive Internet use using the Internet for coping. This suggests that the diagnosis of maladaptive use could be underestimated in females when assessing compulsive Internet use is based on the average of all other dimensions. Further, middle aged unemployed females experience higher levels of compulsive Internet use than their male counterparts. A tentative explanation could be related to this specific group's life stage. The Office for National Statistics (2012) revealed that the highest number of divorces in 2011 was in the age range 40 to 49. Establishing new social networks can be a challenge when individuals are accustomed to living in a long term-relationship, and the Internet may

serve as a smooth transition. This can be especially relevant for women, as some statistics suggest that females tend to perceive successful relationships with families more so than men, citing friendship as secondary to family (APA, 2013). This, however, requires further investigation.

Another distal driver that was studied was the employment condition. To the best of the authors' knowledge, this study is the first to evaluate the prevalence of compulsive Internet use including equally employed and unemployed individuals. Differences on compulsive Internet use regarding employment status were not found. This could be because unemployed participants were selected only if they had lost employment over the last twelve months, hence they were in a relatively short-term unemployment condition. It could be that longer-term unemployed individuals would score significantly higher levels of compulsive Internet use than employed ones. Nonetheless, note that unemployed individuals were the highest Internet users (6-9 hours or more) compared to employed ones. Since previous studies have found hours of usage as a proxy of compulsive Internet use, this high usage was identified as a potential risk factor to develop compulsive Internet use in the long term. This is particularly relevant due to the high unemployment rates following the economic recession in the West.

Regarding the source of social support, face to face interactions could be a preventive factor for compulsive Internet use as there were significantly less individuals whose main source of social support was non virtual in the compulsive user category. This supports previous studies regarding the benefits of face to face interactions (McEwan and Zanolta, 2013). It was also confirmed that working excessively (the behavioral component of workaholism) was a proximal driver of compulsive Internet use. According to Porter and Kakabadse (2006), those that have a tendency to work excessively and compulsively are more likely to end up developing patterns of unhealthy technology use. This is the first quantitative study to confirm this statement. Interestingly, further analysis revealed that working excessively was positively related to life satisfaction; whereas, working compulsively was negatively related. These findings are in line with Bonebright et al.'s (2000) study, who found that enthusiastic workaholics experience high work-life conflict yet high levels of life satisfaction. Furthermore, social support seemed to buffer the impact of working excessively on compulsive Internet use, but only at low levels of working excessively. In contrast, at high levels of working excessively, high social support seemed to predict a stronger relationship between working excessively and compulsive Internet use. It

could be argued that workaholics are more likely to use virtual social support, as this is more readily available and fits better in their busy schedules. Thus, when they have high social support this is likely linked to higher Internet usage and is a relevant risk factor in compulsive Internet use (Porter and Kakabadse, 2006).

5.2 *Practical applications, limitations and future research*

First, risk factors that society should acknowledge have been identified. Experiencing unemployment and difficulty to access the job market puts individuals' mental health at risk including depression and anxiety (Datta et al., 2010). It was demonstrated that this can also result in the development of maladaptive Internet use patterns, which could worsen their mental health and add a significant new risk. In view of this, development of healthy Internet use guidelines for this sector of the population is crucial. Regarding compulsive Internet use in employed individuals, organizations seem to focus on the extent to which individuals lose working hours using the Internet for personal purposes. In contrast, those individuals who work long hours and use technology to work outside office hours are overlooked, mainly due to their work success. Based on the findings regarding the link between working excessively and compulsive Internet use, companies are urged not to underestimate the risks involved in encouraging working excessively. Thus, it could be that higher damage to the companies comes from over-achievers who are somehow encouraged to work long hours. Those who enjoy high social support are more at risk to develop maladaptive use. Further, it is necessary for organizational cultures to continue developing and enhancing work-life balance and proactively engage with risk assessment regarding technology use and workload beyond mere control mechanisms.

Limitations of this study include the risk of common method bias. Additionally, this is a cross-sectional study so we cannot determine the drivers' different contributions over time. Future studies should include a longitudinal design in order to confirm the sequential development of the process. Another limitation concerns the generalizability of the results. The sample comprises panelists from market research mostly done online; therefore these participants can be heavier Internet users than the general population. Nevertheless, Internet use of the study sample may not differ significantly from the general British population based on the high use reported by the Office for National Statistics (2013a, 2013b). Figures revealed that more than 95% of the people surveyed (aged 16 to 65) had used the Internet actively within the last three months and more than 67% used it every day. Further, the Internet was readily available in more than 80% of the households. In conclusion, it has been

demonstrated that compulsive Internet use is a problem that is not just restricted to student and young sectors of the population, but that unemployment is a potential risk factor. Importantly, working excessively can be both a source of life satisfaction and the strongest predictor of compulsive Internet use.

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Table 1a Impact of two-level demographic variables, workaholism, personality and well-being on compulsive Internet use

Variable	Non Compulsive internet users (n=189; 36.6%)	Compulsive internet users (n=327; 63.4%)	All (n=516)	Sig.
Gender (% male)	97	162	259	.383
Education (%higher education)	48	97	165	.174
Employed (% yes)	92	168	260	.309
Single (%yes)	48	121	169	.007
CIU	24.5	46.6	38.5	.000
Internet usage outside work per day	2.7	4.8	3.6	.000
Emot. stability	9.7	8.2	8.8	.000
WE	12.0	13.2	12.7	.000
WC	12.5	13.1	12.9	.057
Social support	17.1	16.5	16.7	.193
Life satisfaction	19.2	17.7	18.2	.025
Gaming/gambling (%yes)	2	31	33	.000
Sexually experiences (%yes)	7	35	42	.003
Shopping (%yes)	5	59	64	.000
Email (%yes)				
Virtual world (%yes)	7.3	12.7	20	.000
Social Media (%yes)	7	62	69	.000
Internet and/or surfing (%yes)	6	92	98	.000
Drugs (%yes)	3.7	6.3	10	.069
Alcohol (%yes)	7	29	36	.078
Age	46.7	38.8	41.7	.000

Note: Sig. (Significance, p<.05)

Table 1b Impact of three-level demographic variables

Variable	% Non-Compulsive internet (adjust. standardized residuals)	% Compulsive internet (adjust. standardized residuals)	%Employed (adjust. standardized residuals)	%Non employed (adjust. Standardized residuals)
Main source of social support				
1. Virtual	2.7 (<1.96)	5.4 (<1.96)		
2. Non virtual	27.5 (2.4)	41.1 (-2.4)		
3. Both	3.1 (-3.1)	11.6 (3.1)		
4. None	3.3 (<.196)	5.6 (<1.96)		
Age groups				
1. 18-24	2.5 (-4.1)	13 (4.1)		
2. 25-34	6.6 (-2.2)	19.6 (2.2)		
3. 35-44	3.9 (<1.96)	5.8 (<1.96)		
4. 45-54	8.1 (<1.96)	11.4 (<1.96)		
5. 55-64	15.5 (5)	13.6 (-5)		
Usage				
1. 1-3			55.2 (2.8)	44.8 (-2.8)
2. 3-6			48.8 (<1.96)	51.2 (<1.96)
3. 6-9			34.8 (-2.2)	65.2 (2.2)
4. 9+			28.6 (-2.4)	71.4 (2.4)

Note: Adjusted Standardized residuals above +/-1.96 show

Table 2 Factor loadings, construct reliability and average variance extracted

Construct and indicators	Factor loadings
Compulsive Internet Use_a (CIU) Average Variance Extracted: .66; Construct reliability :. 91	
CIU-Loss of control parcel	
CIU1How often do you find it difficult to stop using the internet when you are online?	
CIU2How often do you continue to use the internet despite your intention to stop?	.868 _a
CIU5 How often are you short of sleep because of the internet?	
CIU9 How often have you unsuccessfully tried to spend less time on the internet?	
CIU-Preoccupation	
CIU4 How often do you prefer to use the internet instead of spending time with others (e.g. partner, children, parents and friends)?	.842 _a
CIU6 How often do you think about the internet, even when not online?	
CIU7 How often do you look forward to your next internet session?	
CIU-Conflict	
CIU 3How often do others (e.g. partner, children, parents, friends) say you should use the internet less?	.870 _a
CIU 8 How often do you think you should use the internet less often?	
CIU10 How often do you rush through your (home) work in order to go on the internet?	
CIU11How often do you neglect your daily obligations (work, school or family life) because you prefer to go on the internet?	
CIU-Tolerance	.733 _a
CIU15 How often do you feel the need to engage more intensively (e.g. more hours, more variety) in your favourite online activities?	
CIU16 How often do you feel the need for better equipment or more software?	
Emotional Stability (ES) Average Variance Extracted: .46; Construct reliability :. 65	
ES1Anxious easily upset.	0.689
ES2 Calm, emotionally stable	0.655
Working excessively (WE) Average Variance Extracted: .40; Construct reliability:.71	
WE1 I seem to be in a hurry and racing against the clock	.433 _b
WE2 I find myself continuing work after my co-workers have called it quits	.614
WE4 I stay busy and 'keep my fingers in many pies'	.609
WE6 I spend more time working than socializing with friends, on hobbies, or on leisure activities	.624
WE8 I find myself doing two or three things at one time such as eating lunch and writing a memo, while talking on the phone	.586
Working compulsively (WC)Average Variance Extracted: .47;Construct reliability:. 77	
WC3 It's important for me to work hard even when I don't enjoy what I'm doing	.642
WC5 I often feel that there's something inside me that drives me to work hard	.772
WC7 I feel obliged to work hard, even when it's not enjoyable	.694
WC9 I feel guilty when I take time off work	.595
WC10 It is hard for me to relax when I'm not working	0.477 _b
Social support (SS) Average Variance Extracted: .51; Construct reliability :. 84	
SS1 Someone to confide in or talk to about your problems	0.685
SS2 Someone to get together with for relaxation	0.786
SS3 Someone to help you with daily chores if you were sick	0.637
SS4 Someone to turn to for suggestion about how to deal with a personal problem	0.745
SS5 Someone to love and make you feel wanted	0.707
Life satisfaction (LS) Average Variance Extracted: .66; Construct reliability :. 91	
LS1. In most ways, my life is close to my ideal	0.855
LS.2 The conditions of my life are excellent	0.858
LS3. I am satisfied with my life	0.934
LS4. So far I have gotten the important things I want in life	0.753
LS5. If I could live my life over, I would change almost nothing	0.638

Notes: Factor loadings in CIU have an sub index X_a as this are item parcels made of conceptually related items to have similar number of indicators for each latent variable. Subindex _b denotes the items that were omitted from further analysis due to low factor loadings.

Table 3 Significant paths with Structural Equation Modeling

Hypothesis		Paths	Estimate	SE	Goodness of fit indices Measurement model	Goodness of fit indices Structural model
H5	CIU	← Emotional stability	-.378**	.065	X/df =2.38	X/df =2.40
H6	CIU	← WC	.611*	.499	CFI=.940	CFI=.946
H6 Control	WC	← Emotional stability	-.018	.040	GFI=.907	GFI=.913
H7	CIU	← WE	.831**	.074	NFI=.903	NFI=.911
H7Control	WE	← Emotional stability	-.042	.043	IFI=.941	IFI=.946
No hypothesis	Life satisfaction	← Social support	.495**	.083	RMSEA=.052	RMSEA=.052
No hypothesis	Social support	← Emotional stability	.162*	.077		
No hypothesis	Life satisfaction	← WC	-.537*	.636		
No hypothesis	Life satisfaction	← WE	.623*	.611		

Notes: Note: χ^2/df =Chi Square differences divided by degrees of freedom; CFI_Comparative Fit Index; GFI_Goodness of Fit Index; NFI_Normed Fit Index; IFI_Incremental Fit Index; RMSEA_Root Mean Square Error of Approximation

Table 4 Moderation analysis

Model Summary	Compulsive Internet Use			
<i>Standardized coefficients</i>	Step1	Step2	Step3	Step4
Step 1: Control Vbs.				
Age	-.330***	-.306***	-.314***	-.306***
Gender	.034	-.054	-.056	-.059
Step 2: Main effect				
Working excessively		.221***	.222***	.228***
Step3: Moderator variable				
Social support			-.060	-.052
Step4: Interaction				
Working excessively*social support				.088*
Adjusted R ²				.155
ΔR^2		.048***	.003	.008*

†p<.10, *p<.050, **p<.010, ***p<.001

Table 5 Summary hypothesis of study

Hypothesis	Confirmed?
H ₁ Unemployed individuals spend significantly more hours of internet usage than those in employment.	Yes
H ₂ Those for whom the main source of social support is virtual are more likely to experience compulsive Internet use than those whose main source is face to face.	Yes
H ₃ There will be significantly more compulsive internet users among the young groups than among the older groups	Yes
H ₄ There is a significant interaction effect between employment condition, gender, age and compulsive internet use. In particular, unemployed, young and male participants will score significantly higher levels of compulsive internet.	Partially confirmed
H ₅ Emotional stability is positively correlated to Compulsive Internet Use	Yes
H ₆ Working compulsively is positively associated with CIU beyond emotional stability	Yes
H ₇ Working excessively is positively associated with CIU even when controlling emotional stability	Yes
H ₈ A higher level of life satisfaction weakens the relationship between workaholism and CIU.	No
H ₉ A higher level of social support weakens the relationship between workaholism and CIU.	Partially confirmed

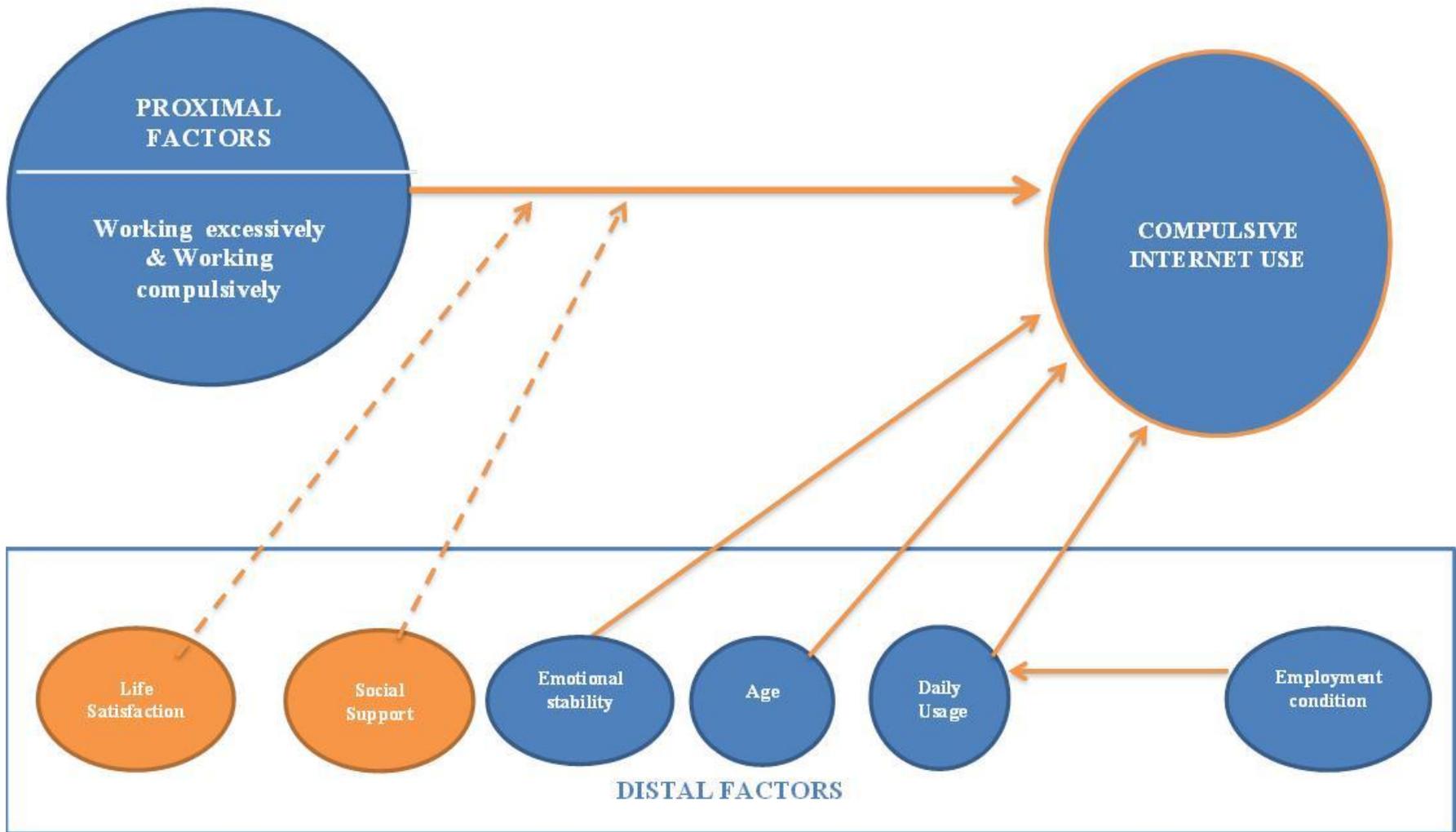


Figure1-Theoretical model

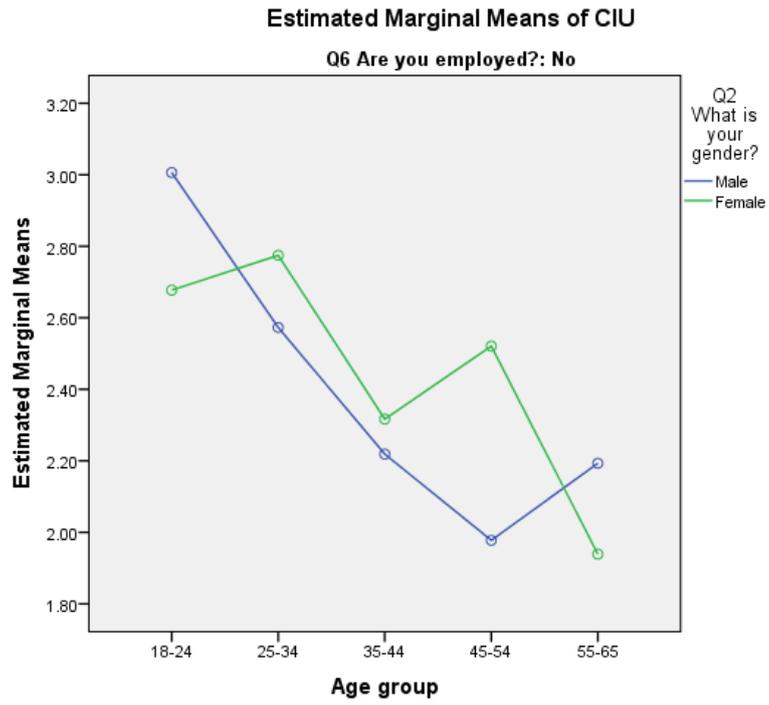


Figure 2-Interaction age and gender by employment condition

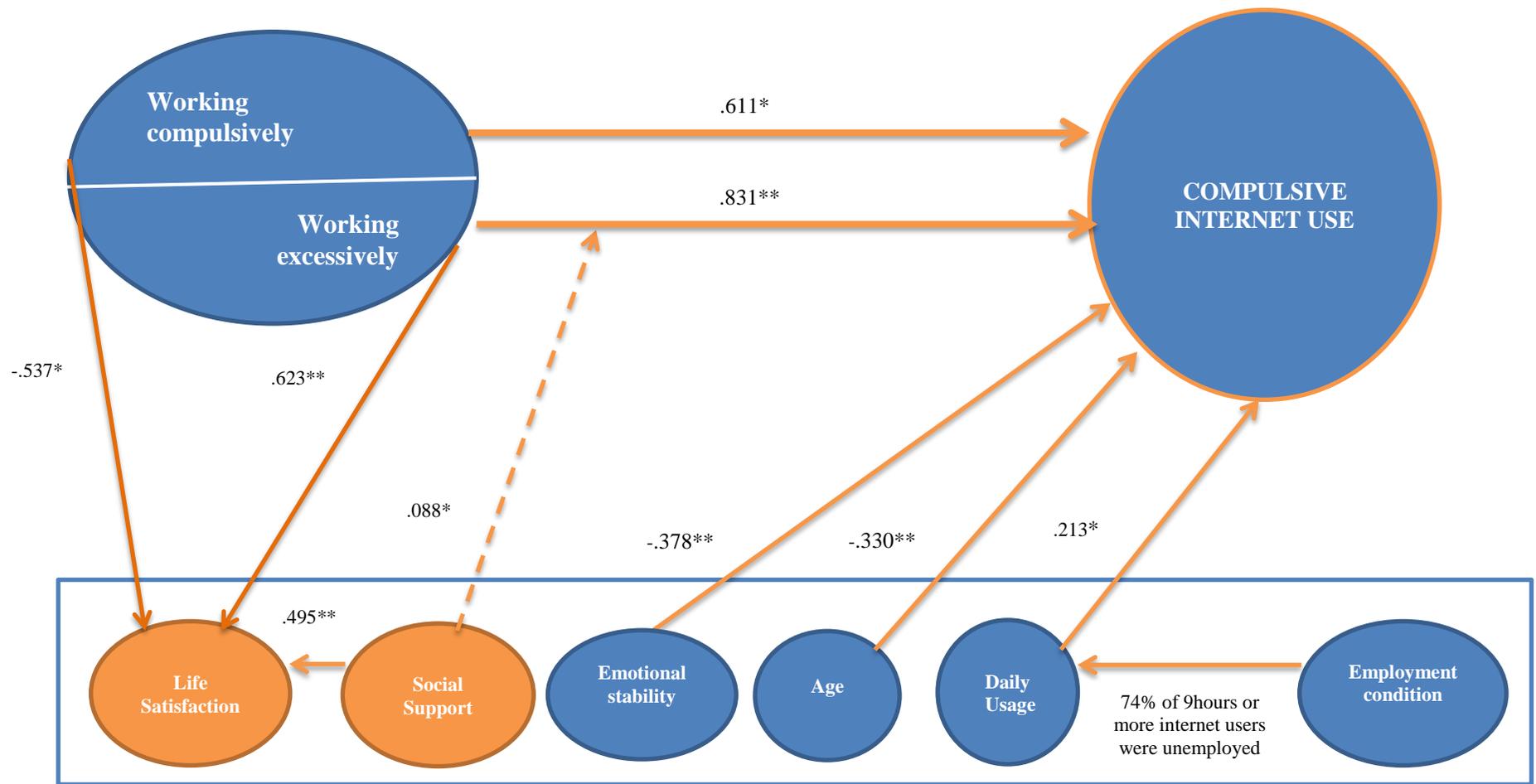


Figure 3- Theoretical model with path estimates

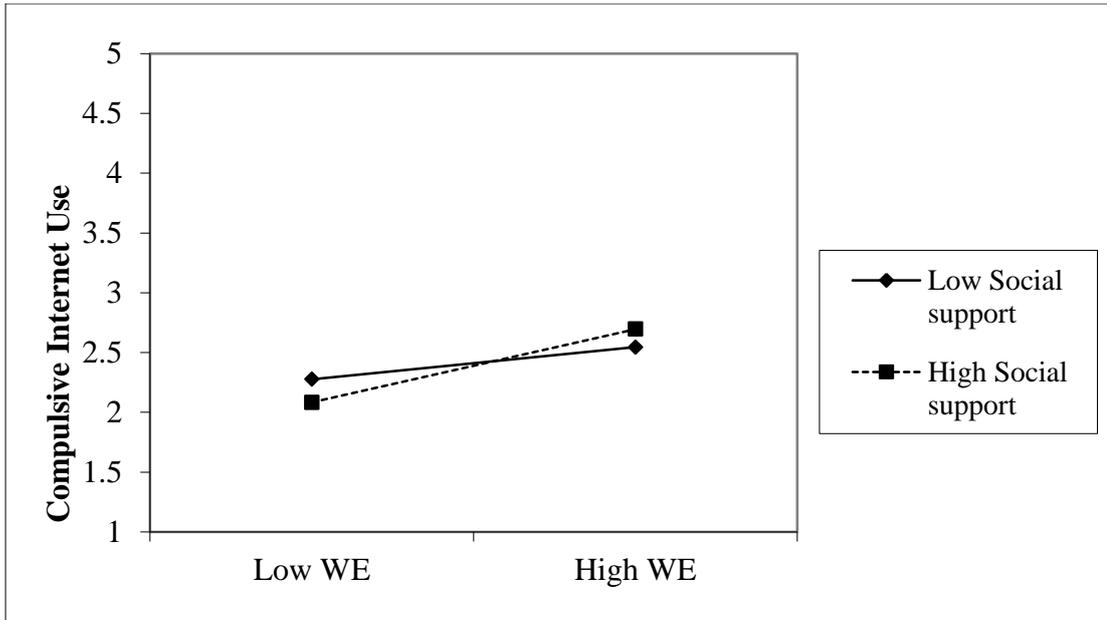


Figure 4- Moderation of social support on the relationship between workaholism and compulsive Internet use.