PREDICTIVE ROLE OF PERSONALITY TRAITS ON INTERNET ADDICTION

Serkan ÇELIK
Hasan ATAK
Kirikkale University Faculty of Education
Department of Computer Education and Instructional Technologies
Yahsihan, Kirikkale, TURKEY

Ahmet BAŞAL
Yıldız Technical University Faculty of Education
Department of Foreign Languages Education
Esenler, Istanbul, TURKEY

ABSTRACT

Aiming to develop a model seeking to investigate the direct effects of personality types on internet addiction, this study was set and tested on tertiary level students receiving education within two learning modes: face to face and distance education. The participants of the study, selected through maximum variety method within purposive sampling, included 210 students enrolled on face-to-face and distance education programs of computer programming department. In addition to a personal data form aiming to obtain information on demographic features of the participants, a personality inventory and an Internet addiction scale were utilized to gather data. As an analysis model concurrently exerting both the mediation and direct effects, path analysis with observed variables was utilized in the current study to test the developed model. The findings revealed that while the most powerful predictor variable of internet addiction was conscientiousness, openness to experience was found as the weakest independent variable predictor. Additionally the developed model was observed as valid for both face to face and distance education students.

Keywords: Internet addiction, distance education, personality.

INTRODUCTION

As the cutting age technological development that eliminates barriers across the globe and connects people regardless of their age, educational level and social status, the Internet has been considered a a boon for the human society (Widyanto & Griffiths, 2006; Douglas et al. 2008; Byun et al. 2009). However, despite the many benefits, much dependence on Internet may trigger a condition defined as Internet addiction disorder Griffiths, 2000; Yalın, Karataş, & Karabulut, 2011).

The term 'internet addiction' (IA) is alternatively used throughout the literature with the referents of "internet dependency", "pathological internet use", "problematic internet use" "excessive internet use", "internet abuse" and "internet addiction disorder" (Griffiths, 2000; Griffiths, 2005; Yalın, Karataş, & Karabulut, 2011; Young, 2004; Young & Case, 2004).

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Internet addiction is considered a psychological problem worldwide since it has a negative effect on behavior, such as preventing social interactions and reducing academic performance (Scherer, 1997; Morahan-Martin & Schumacher, 2000; Young, 1998) impairing personal functions (Tsai & Lin, 2003), and harming personal relationships (Beard, 2002).

Internet addicts stay online for long hours, prefer to contact people with internet instead of other forms of social contact and want to stay online rather than experiencing life events outside (Weinstein & Lejoyeux, 2010). These behaviors could affect the lives of users irreparably if not treated with appropriate methods.

It is therefore necessary to investigate the reasons causing internet addiction and the ways to eliminate the problem. To this end, investigating the factors leading to IA should be the starting point of any scientific inquiry.

Among the people threatened with the excessive internet use, university students are considered as a potential group for investigating IA (Frangos, Frangos, & Kiohos, 2010). Free and unlimited internet access, long periods of unstructured time, newly experienced freedom from parental control, no monitoring or censoring of what they say or do online, full encouragement from faculty and administrators, social intimidation and alienation, are all possible reasons for IA among university students[7]. Uncontrolled and excessive use of the internet may result in negative consequences in the lives of this group. Correspondingly, this problem has received close attention from educators, psychologists and psychiatrists, since IA intervenes with interactions with other people, academic achievement, psychological wellbeing, marital and interpersonal adjustment (Baruch, 2004; Engelberg, & Sjöberg, 2009; Morahan-Martin & Schumacher, 2000). In Turkey, people between 24 to 34 years of age and who attend higher education have been using internet more than other groups (wordstat.org). In view of the age range of this group, it is clear that IA posses a serious risk for university students in Turkey.

As a result of the rapid growth in internet technologies, distance education has mostly been conducted through the use of the web-based Learning Management System (LMS) worldwide. Since it is necessary for distance students to be online in order to reach the content and other elements provided through LMS, they are more likely to spend more time on the internet compared with students receiving face to face education. In view of this fact, distant learners seem to be a convenient group to examine the internet related behaviour. Many studies have been conducted on the different aspects of IA of university students (**Batıgün & Hasta, 2010; Sepehrian & Lotf,** 2011; Tsai, et al. 2009). However, no studies have been found in the literature relating to the IA of university students receiving web-based distance education.

Among many factors connected with IA, personality has been shown to profoundly influence internet use (Weibel, Wissmath, & Groner, 2010). In other words, interpersonal factors can significantly affect the behavior of internet users' behavior and certain personality traits including shyness, introversion and social withdrawal are closely related with Internet addiction (**Kesici & Şahin, 2009;** Xiuqin et al, 2010). Starting from this premise, this study aims to investigate the effect of personality traits and learning mode on Internet addiction among tertiary level students.

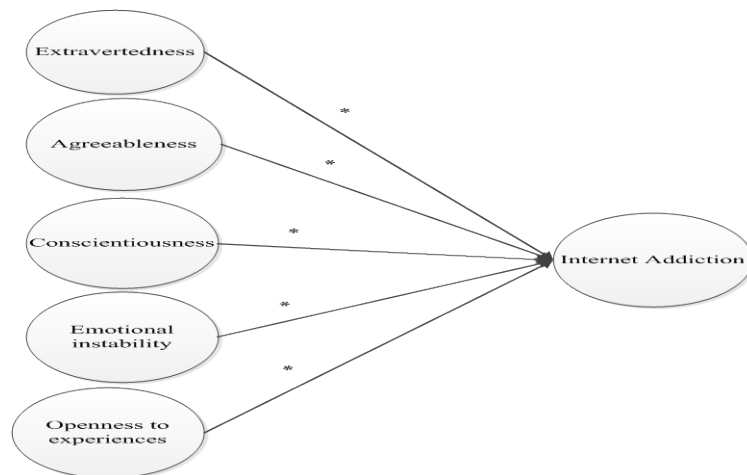To this end, the anticipated hypothesis model was shown below;

Figure: 1
Hypothesis Model of Personality Traits-IA

As figured above, the independent variable of the current study is personality trait and the dependent variable is set as internet addiction. The following hypotheses were addressed in line with the proposed model;

> ➢ The direct effect of personality traits on internet addiction is significant,
> ➢ The personality traits-internet addiction model is not valid for both learning modes.

METHOD

This survey-based study set out to explore the relationship between personality traits and internet addiction among tertiary level students studying within face-to-face and distance education modes.

Participants

The participants of the study included 210 students enrolled at both formal and distance education programs on computer programming courses. The participant groups were determined through purposive sampling method using the criteria of whether they involve(d) in tertiary education or not (Buyukozturk, **Kılıc**-Çakmak, Akgun, Karadeniz, & Demirel, 2008). This sampling method is promoted to reflect important clues related to the values of universe and aims to observe the most suitable section(s) of the universe in terms of the nature of the problem (*Fraenkel,* & *Wallen, 1993;* Sencer, 1989). The proposed model in the current study includes five parameters and the ratio of participant groups to the number of parameters was observed as (210/5) 42 which indicates an acceptable sample size to test the structural model (Kline, 1998).

Originally, the data collection instruments were administered to 230 participants, however 20 respondents were removed from the dataset since they either left at least 5% of the items blank or central tendency errors were observed.

The analyses were conducted on 90 females (42.9%) and 120 males (57.1%) of which ages are ranged from 19 to 26. Demographic information of the participants including gender, learning mode, age, and SES are tabulated below.

Table: 1
Descriptives on participants` demographic features

Variable		N	%
Gender	Female	90	42.9
	Male	120	57.1
Learning Mode	Face-to-face Education	121	57.6
	Distance Education	89	42.4
Age Interval	19-21	68	32.38
	22-24	72	32.29
	25-26	70	33.33
Perceived SES	Low	86	40.96
	Medium	92	43.80
	High	32	15.24
Total		210	100

Data collection instruments

In addition to a personal data form aiming to obtain information on demographic features of the participants, a personality inventory and an Internet addiction scale were utilized to gather data. The *Ten-Item Personality Inventory (TIPI),* developed by Gosling, Rentfrow and Swann (2003) and adapted to Turkish by Atak (2010) was used to assess personality. TIPI was considered to be capable of measuring personality within 10 items through many validity studies (Denissen, et al. 2008; Ehrhart, et al. 2009; Gosling, 2012; Hofmans, Kuppens, & Allik, 2008; Muck, Hell, & Gosling, 2007; Soto, et al. 2011). A variety of measurements and methods were utilized to assess internet addiction in the previous work (Beard, 2005; Cengizhan, 2003; Chou, Condron, & Belland, 2005; Thompson, 1996; Young, 1998). The internet addiction scale including 20 items with six-level rubric was developed by young and adapted to Turkish by Bayraktar (2001) who declared a .91 Cronbach`s Alpha value. Batıgün and Hasta (2010) also maintained in their study that the internet addiction scale possesses a .90 Cronbach`s Alpha value.

Data Analysis

Descriptive statistics were used to analyze participants` demographic features and means of scales. Path analysis with observed variables was utilized to test the developed model at a .05 significance level. Prior to pursuing model analysis, the assumptions of the model (outlier, multicollinearity, relations between the variables and sample size) were tested. The relations among the variables were observed as linear and no variance was observed through the levels of the variables (heteroscedasticity). All the clues have maintained that the assumptions of the path analysis were provided within the data set.

Process

The data were gathered voluntarily from face to face students on a group basis. Distant students were provided data individually through the school's online system. Students were provided with explanations on the objective of the study prior to the application of the instruments which took face to face learners 15 minutes to complete.

FINDINGS

This section is devoted to the results of descriptive and correlational statistical analysis conducted in relation to the dependent and independent variables.

Means and standard deviations were calculated and tabulated below.

Table: 2
Descriptive Statistics

	$\overline{X}$	Ss
Extravertedness	9.47	2.44
Agreeableness	8.73	2.72
Conscientiousness	10.62	2.38
Emotional stability	9.80	2.89
Openness to experiences	7.57	2.71
Internet Addiction	32.45	16.26

Table 2 highlights that while the respondents received the highest point from the consciousness ($\overline{X}$ =10,62) sub-scale among the personality types, openness to experience ($\overline{X}$ =7,57) was the least popular option. The mean of the respondents` values obtained from internet addiction was observed as 32.45.

Results of personality traits and internet addiction model

The findings related to zero-order correlations between the variables and standardized coefficients, representing relations among the variables of the developed model are presented here. The correlations among the variables are shown below in Table: 3.

Table 3
Zero-Order Correlations among the variables

	Extravertedness	Agreeableness	Conscientiousness	Emotional instability	Openness to experiences	Internet addiction
Extravertedness	1	-.07	.25**	.28**	-.07	-.16*
Agreeableness		1	.07	-.07	.03	.18*
Conscientiousness			1	.73**	-.05	-.20**
Emotional stability				1	.04	-.17*
Openness to experience					1	.14*
Internet addiction						1

*p < .05, **p < .01

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The results relating to the correlation between personality types and internet addiction indicates that while the highest correlation rate (r=-.20, p<.01) is observed as the conscientiousness trait, the lowest rate (r=.14, p<.05) is observed as openness to experience.

The good fit indexes of the model are given in Table 4.

Table: 4
The overall fit indexes related to Post-Hoc model variances

The good fit index	Value
χ^2/sd* (123,12/48)	2.56
RMSEA	0.04
NNFI	0.94
CFI	0.95
GFI	0.91
RMR	0.14
SRMR	0.03
NFI	0.92

* p<.01

Table: 4 indicates that the good fit indexes belonging to the model are at acceptable levels. The fit index rates of the models` components (personality types and internet addiction) which indicate a good fit (Hofmans, Kuppens, & Allik, 2008).
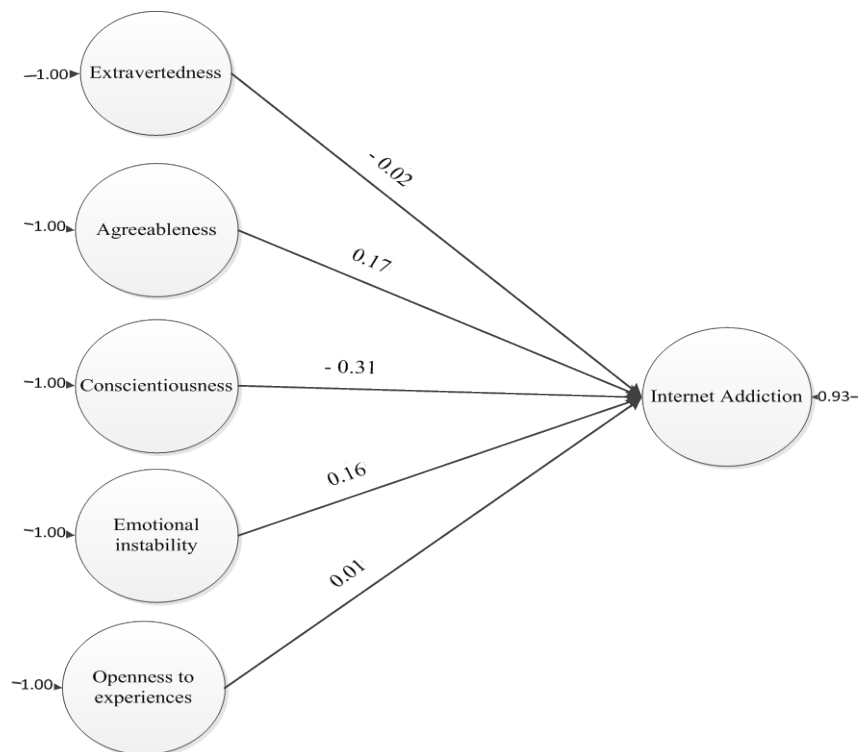

Figure: 2
Final Model (Standardized Coefficients)

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Figure: 2 implies that standardized coefficients explaining the relations between the dependent and independent variables vary between. 01 and. 37 (p<.01). Standardized path coefficients are labelled as having low (nearly .10), medium (nearly .30), and high (nearly .60) effects in relation to their values (Kline, 2005).

Therefore, conscientiousness (ß=-.31, p<.01) at a medium level effect size is observed as the most powerful predictor variable of internet addiction. Conversely, openness to experience (ß .01, p<.01) having a low effect size is the weakest predictor variable of internet addiction.

The model also implies that while extravertedness possesses a very low effect on internet addiction (ß=-.02, p<.01), agreeableness (ß=.17, p<.01) and emotional instability (ß=.16, p<.01) also have low effect sizes. In other words, a one point increment observed on the conscientiousness relates to internet addiction as a 0.31 decrease or a one point increment on openness to experience influences addiction by having a value of 0.01and so on.

Results of the model`s validity on learning modes
The validity of the model on the face-to-face and distance education groups was tested with a multi-group path analysis. Prior to conducting the model analysis, since the CFI value is not affected from the sample size comparing to the other fit indexes (Cheung & Rensvold, 2002; Kline, 2005; Tabachnick, & Fidell, 2007), and the number of participants in each group is relatively low, the CFI values belonging to models calculated for each group were provided.

The results for the groups were observed as follows; 0.92 for face-to-face group and 0.90 for distance education group. Hence, assuming that model analysis is not under effect of sample size, multi-group path analysis was conducted. The descriptive are presented in Table: 5.

Table: 5.
Descriptive statistics of the scales on Face-to-face Education and distance education groups

	Group	N	$\overline{X}$	Sd
Extravertedness	Face-to-face Education	121	9.47	2.44
	Distance Education	89	9.47	2.62
Agreeableness	Face-to-face Education	121	8.73	2.72
	Distance Education	89	8.78	2.68
Conscientiousness	Face-to-face Education	121	10.62	2.38
	Distance Education	89	10.80	2.38
Emotional stability	Face-to-face Education	121	9.80	2.89
	Distance Education	89	9.96	2.82
Openness to experience	Face-to-face Education	121	7.57	2.71
	Distance Education	89	7.57	2.67
Internet addiction	Face-to-face Education	121	32.45	16.26
	Distance Education	89	34.26	16.72

The research focusing on the differences among the good fit indexes of multi-group model analyses applications conclude that the difference between RMSEA values should be higher than 0.01 in order to indicate a difference between two models (Cheung & Rensvold, 2002). The differences between the RMSEA values of the models were checked (ΔRMSEA) and the model having a lower rate was considered as valid when the difference is over the critical value proposed by the literature.

When the difference is not over that critical value, the other models (B, C, D) were considered not providing a better explanation than model A. Hence, the model A set on the assumption of having similar factor loads and error variances is regarded as same and valid for both groups (Brown, 2006; Kline, 1998). The results shown above indicate that the means of both groups on all scales are rather similar. The values related to the models are presented in Table: 6.

Table: 6
Multi-sample Path analysis results on the personality types-internet addiction model

Models	χ^2/Sd	RMSEA	ΔRMSEA
Model A	2.56	0.047	
Model B	2.49	0.045	0.002
Model C	2.47	0.045	0.002
Model D	2.54	0.044	0.003

The findings related to the dual comparisons of the basic model (Model A) with Model B, Model C, and Model D are as follows: the fit indexes (RMSEA Values) of Model B (having inner relations of the groups between the variables), Model C (having free error variances and coefficients between the variables), and Model D (having different error variances for each group) are not significantly better than Model A (assuming similar coefficients between the variables for each group). Besides, χ2/sd values are observed as very closer to each other (χ2/sd ratios for all models are nearly 2.5). In light of the findings, Model A, having the highest fit indexes comparing to the other groups, is accepted.

In brief, the personality type-internet addiction model is valid for both face to face and distant learners.

DISCUSSION AND CONCLUSION

This study produced results which partially support the findings of a wealth of previous work in the field. However, the findings of the current study do not support the findings of all previous studies.

For instance, findings are not consistent with those of Kraut et al., (2002) (though it focused on internet usage rather than IA) who found a positive relation between extravertedness and internet addiction. Extravertedness was observed as having a negative effect on IA. Although this result differs from some published studies, the contradiction may be explained by the fact that the majority of the previous research in the field was conducted in the western culture which is generally considered to prize individuality.

However, the current study was conducted within a Turkish-orientated society commonly considered as a social community prizing collectiveness as opposed to individuality **(Kağıtcıbaşı, 1996)**, reducing the need to use the internet for extraverted people when compared to other personality types. Another possible explanation for the inconsistency is that the relevant literature posits a triggering effect of IA caused by a lack of social support (Papacharissi, & Rubin, 2000; Yeh, Ko, Wu, & Cheng, 2008). Extraverted people tend to initiate social interaction and are considered more successful in establishing effective communication.

These findings further support the idea of Inderbiten, Kubey, Lavin and Barrows arguing that introvert people having problems in interpersonal relations do prefer using the internet and may substitute real and face to face relations for cyber communication (Kubey, Lavin, & Barrows, 2001).

The relevant literature also states that emotional instability (Hamburger, & Ben-Artzi, 2000) and being open to experience (Tuten, & Bosnjak, 2001) have a positive relationship with IA. The findings of the current study, in relation to emotional instability and openness to experiences, seems to be consistent with those of other studies showing that emotionally instable people who are described as stressed, fragile, depressed, and careless are not fully capable of developing reliable relations and pursuing social interactions (Hojat, 1982). Morahan-Martin and Schumacher (2000) underlines that emotionally unstable people feel greater inner loneliness and become addicted to the internet more easily. A few previous researchers emphasized the positive relation between the high rates observed on internet addiction and loneliness ((Durak-**Batıgün & Kılıç, 2011; Eijnden, et al. 2008; Erdoğan, 2008)**. Additionally, the minor positive effect of openness to experience on IA can be explained by the motivation of these people for their interest in experiencing new things and their curiosity towards exploring the internet (Levine & Stokes, 1986).
One of the notable outcomes of the current study is that there is a negative effect between agreeableness and conscientiousness (medium level) and internet addiction. This particular finding corroborates the ideas generated within the literature (Durak-**Batıgün, & Kılıç, 2011;** Tuten & Bosnjak, 2001). Tuten and Bosnjak (2001) elaborate that since conscientious people are known as dependable and disciplined, they have no barriers against developing face to face relations and meeting their social support needs. Thus, the negative relationship between the conscientious personality type and IA should be considered reliable.

In contrast to the previous research stating a negative effect of agreeableness and internet addiction (Bayraktar, 2001), current study indicates a low positive effect of that personality type on internet addiction. Since agreeable people are generally known as introvert and shy, they may have a tendency to seek social support using the internet rather than seeking it naturally in real life. A solid body of literature focuses on the relationship between social support and IA (Durak-**Batıgün, & Kılıç, 2011;** Inderbiten, Walters, & Bukowski, 1997; Kubey, Lavin, & Barrows, 2001).

One of the other findings of the study is that the developed model is valid for both face to face and distance education students. In view of the relevant literature, there appears to be no study that specifically investigates these variables in a model and analyzes their validity in different groups. Jackson and his colleagues expressed that education and income levels once had a relationship with internet usage, however, this is no longer the case (Jackson et al. 2003).

There has been a substantial increase in the number of subscribers to the internet in Turkey (Internet World Stats, 2012). The validity of the personality traits and IA model can also be explained with the increasing spread of the internet. The findings of the current study enhancing our understanding of the relation between personality traits and IA can also contribute to the research field in terms of prevention and cure of internet addiction.

As one of the limitations of the study, the previous research claims many problems regarding the measurement of personality (Atak, 2010; Gosling, et al. 2003). Utilizing a short instrument such as TIPI could also be mentioned as a limitation for the current study. However, reliability and validity rates of the TIPI imply that it could be used to measure personality in Turkish culture (Atak, 2010). Another limitation of this study is that the numbers of participants were relatively small. However, the assumptions of the model analysis followed in this study may provide a chance to over come this limitation. Another source of weakness in this study which could hare affected the measurements of was that the number of participants in each group did not meet the assumption of the model analysis while conducting multi-group model analysis. To overcome this problem, CFI values, which are not affected by sample size, were calculated for each group. The obtained values pointed out that the analysis was not affected by the sample size. Further work needs to be done to establish the effect of different independent variables on IA through bigger samples. Personality may be viewed as a starting point in this respect and multi variables such as family support, income, agency, autonomy and etc.

BIO DATA AND CONTACT ADDRESSES OF AUTHORS

Serkan ÇELIK, Ph.D The author got an MA degree from Bilkent University TEFL program and holds a Ph.D from Computer Education and Instructional Technologies department of Ankara University, faculty of Educational Sciences. He worked as a teaching fellow at Boston University in USA. He is currently employed at Kirikkale University as a faculty. His research interests are instructional design theory, technology enhanced learning, applied linguistics, and language pedagogy.

Assistant Professor, Serkan ÇELIK, PhD
Kirikkale University Faculty of Education
Yahsihan, Kirikkale TURKEY
Phone: (318) 357 2488
E-mail: sercelikan@yahoo.com

Hasan ATAK, Ph.D The author got MA and Ph.D. degrees (Educational Psychology) from Ankara University Institutes of Educational Sciences. He is currently employed at Kirikkale University Educational Faculty. His research interests are transition to adulthood, identity development, agency, personality, parental bonding, and emerging adulthood.

Assistant Professor, Hasan ATAK, PhD
Kirikkale University Faculty of Education
Yahsihan, Kirikkale TURKEY
Phone: (318) 357 2488
E-mail: hades062002@yahoo.com.hk

Ahmet BAŞAL, **Ph.D.** is an assistant professor in the Department of **Foreign Languages Education, Faculty of Education at Yıldız Technical** University in Turkey. He holds an MA from the English Language Teaching Department of Çukurova University and a Ph.D. from Curriculum and Instruction of **Fırat University. His research interests** include academic writing, material development in language education and web-based language education.

Assist. Prof. Dr. Ahmet BAŞAL
Yıldız Technical University, Faculty of Education
Department of Foreign Languages Education
Davutpaşa Campus, 34220 Esenler, İstanbul, TURKEY
Phone : 05055723380
E-mail: ahmetbasal@gmail.com

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