

Am I A Facebook Addict? An Investigation of Facebook Addiction Using Personality Traits through SEM

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Abstract: Facebook usage has come to a level where it has become an addiction. In this current study, the researchers have aimed to determine the link amongst the big five personality traits and their significance in predicting Facebook addiction. A convenience sample of 339 Facebook users studied to determine Facebook addiction. CFA was performed and all the items were retained. Structural Equation Modelling was performed that determined which personality trait and with what intensity, predicted the Facebook addiction. Facebook addiction and conscientiousness is negatively related to each other. The study concluded that users who are high on Facebook addiction are high on agreeableness trait. Whereas people who are high on the conflict will be less agreeable, thus a negative but highly significant relationship is confirmed. Facebook addiction is positively related to Neuroticism. Only 'Withdrawal' and 'Conflict' produced positive results whereas all other produced negative relation between Facebook addiction and Neuroticism. Our study produced mostly insignificant results for most of the variables measuring Facebook addiction and extraversion. Only salience proved to be highly significant in this case. Our study added to the results of the previous researches done and openness to experience was proved to be positively related to Facebook addiction.

Keywords: *Facebook addiction. Personality Traits*

Introduction

With the advent of technology coupled with globalization, there isn't a possibility that an entity is not affected by the impact of this occurrence. The colossal infusion of the advancement in communication technologies has led to a higher interaction through virtual means, rather than direct communication, and that also, with a larger audience (Akter and Nweke, 2016). The daily lives of the people have been significantly impacted by the social networking sites (SNS), to an extent where it becomes an integral social platform for the communication mediated by computer (Correa, Hinsley, and de Zuniga, 2010; Powell, 2009; Tapscott, 2008). The innovativeness of SNS has been successful in drawing the attention of not only the industry but also of the academicians (Kuan –Yu Lin and His- Peng Lu 2011). Amongst these SNS, the popularity of Facebook has been unprecedented. Currently on the Internet, Facebook is the second most frequently visited website with 1.8 billion monthly visitors (Alexa Internet Inc, 2016). Citizens of the world particularly, in the developing nations, which include Pakistan, are increasingly adopting the technology, especially smart phones and social media use (Khan & Murtaza, 2016). In South East Asia Facebook have 560 million active users, which makes up close to 25% of the total population. These statistics are strong evidence that Facebook has impacted the social life of its users (Ryan, Xenos, 2011). Not only that it has been widely accepted globally by people but they have adapted to it for various different reasons, ranging from socialization, professional networking, group and private chatting and wall posts (Dhaha, 2013). Other than the benefits at individual level, Facebook has multiple benefits for young entrepreneurs, as many organizations, institutions and companies are now promoting their businesses among the target population, through this

social media. In today's times, amongst students, one of the most preferred and popular tools for staying in touch is Facebook (Foregger, 2008; Sofiah, et al, 2011; Hew and Cheung, 2012). Students are increasingly relying on the Facebook for communicating and sharing information with friends (Steers et al, 2016). For students, the Facebook serves multiple purposes such as, social comparison, communication, networking, connection, passing time, establishing new ties and maintaining old ones (Foregger, 2008) for entertainment, companionship, and social interaction (Sofiah et.al, 2011) and for staying in contact with friends, de-stressing themselves and for entertainment reasons (Hew and Cheung, 2012). Social media addiction is a problem that is evolving particularly amongst the youth and the evidence is on the increasing trend (Eijnden, et al 2016). Just like all the technological advancement of this age or of any age, SNS in general and Facebook in specific have both negative and positive impact (W. Kim et al. 2010). Many users get caught up in spending long hours in viewing or creating updates that are absolute trivial, or commenting on their so-called online friends and their activities. Excessive usage results in excessive wastage of time resulting in decreased interest in other important jobs in life. As a result the students end up loosing out on great opportunities of getting college/university acceptances, just because they have put up an inappropriate pictures or remarks/comments on the Facebook. The excessive use of social media should be divulged by being engrossed in social media (salience), adoption of social media for the purpose of curtailing the antagonistic emotions (mood modification), progressively using more and more social media, in pursuit of acquiring the same contentment from it (tolerance), to be convulsed by desolation if constrained from using it (withdrawal), immolating other responsibilities, or forgoing pertinent life events caused by continued use of social media (conflict) and having a strong urge to reduce the surrender to the social media use (relapse) (Andreassen, Pallesen and Griffiths, 2017). With keeping this scenario in mind, this current research is an attempt to explore the Facebook addiction and its predictors among the users based on the Big Five Personality Traits, through applying Structural equation Modelling (SEM) approach. The study will enrich the literature on Facebook usage among the users.

Rationale of the current study

The research in field of SNS has so far suggested that the targeted accomplishment of the Facebook users might differ, as it is a function of the personality elements of each individual. Although these findings provide the basic platform that can construct the foundation of the theories related to Facebook, however these studies offer limited generalizability as the data has been exclusively derived from university students. Secondly, the previous researches have also stressed on the importance of having individuals from wider age range and nationalities of origin. Therefore in order to address these issues, current study has investigated the relationship between Big Five personality traits and Facebook addiction among the users who originate from South East Asian countries, may be residing in any other country of the world and belong to a diverse occupation and education levels.

Literature Review

According to a latest research, the most dominant reason for usage of SNS is actually to maintain those relationships that have been established offline, which may be important due to the latent or potential professional and academic opportunities. As a result the excessive usage is observed due to the perceived attraction in staying connected (Kuss and Griffiths, 2011). Researchers have tried to establish a connection between Facebook usage and individual characteristics. Individuals with high Narcissism tendencies, show more activity on SNS, because they perceive these forums to be an opportunity of presenting themselves in a more favourable way according to their "Ideal self-image" (Mehdizadeh, 2010; Buffardi and Campbell, 2008;). Research has been conducted in the past that have concentrated on the big five-factors of personality in order to assess the personality, in the light of the five main dimensions of Agreeableness (e.g., having a sensitive, warm and sympathetic personality),

Conscientiousness (e.g., having an organized and alert) disposition, Extraversion (e.g., having an outgoing, talkative nature), Openness to experience (e.g., having an intellectually oriented streak and being creative) and Neuroticism (e.g., having mood swings and being nervous) (Wiggins, 1996). Previous researchers have established a positive relationship between Agreeableness and Internet usage (Yang and Lester, 2003). Conscientiousness has been reported as negatively related to addiction tendencies of the social media while extraversion has been positively related (Wilson, et al 2010). Extraversion, Neuroticism and Openness to experience are all positively associated with frequency of social media use (Correa, Hinsley, and de Zuniga 2010). Interestingly, the other extreme of Extraversion that is introversion, have also been observed with elevated use of social media. While extroverts utilize social media for the purpose of social enhancement, introverts use to it for compensating themselves socially (Kuss and Griffiths, 2011). Another aspect is with respect to the time, which means that increased usage of social media will eventually result in reduced sleep hours and consequently deteriorating performance in studies (Dewald, et al 2010). Bedtimes and rising times have been severely delayed due to the excessive use to electronic media (Suganuma, Kikuchi, Yanagi, Yamamura, Morishima, Adachi, *et al.*, 2007; Brunborg, *et al.*, 2011). Previous research although, haven't classified the basic content of the computer or mobile phone use. The latest statistics clearly depict Facebook to be the most used Internet site, while the consequences remain reduced sleeping hours and adverse effects on academic performance. An interesting relationship might exist between Facebook addictions and sleep patterns, and this can be of great interest for researchers to study. A variety of other negative consequences have also been identified as a result of addiction to the social network sites by other researchers. Some of these consequences are reduced interactions with real communities, precarious performance in academics, and difficulty in maintaining relationships (Kuss and Griffiths, 2011). The current research is aimed at studying the Facebook addiction amongst its users. Addictive tendencies scale was developed by Wilson, *et al.* (2010), which included the three aspects that were integral in thinking about addictions. The items used in this scale were salience, loss of control, and withdrawal. In addition to those three, (Brown, 1993; Griffiths, 1996, 2005) cumulatively suggested six core components that are crucial in determining the Facebook addiction. These six components are: (1) salience—the activity predominates all behaviour and thought process; (2) mood modification—the activity has the potential to modify/improve mood; (3) tolerance—higher intensity of the activity are needed to acquire previously acquired satisfaction; (4) withdrawal— occurrence of unpleasant sensations when the action is ceased or suddenly reduced (5) conflict—the behaviour results in conflicting relationships, at education or profession and other life events; and (6) relapse—a potential to revert to previous patterns of the behaviour after discontinuance or abstinence.

The current research here has basically used a Facebook addiction scale, BFAS (Bergen Face- book Addiction Scale) along with, as predictors, the five factors of personality also known as the big five personality traits in determining the addiction to Facebook.

The Big Five Personality Trait

Extraversion

Extroverts are basically individuals who are seeking stimulation from sources other than themselves, by gearing their attention outwards (McCrae and Costa, 1999). These individuals have a strong association towards being sociable, active and assertive (Barrick and Mount, 1991; Mark, et al 2014). A dominating personality characteristic of extrovert is that they have a large circle of friends, depicting their high social skills. They are usually members of clubs and sports team and they engage in multiple activities. Facebook is a forum that provides a lot of stimulation; therefore a connection between Facebook addiction and extroverts is studied in the current research. The strong need of the extroverts to be sociable is something that Facebook usage, best satisfies.

Openness to experiences

People with high scores on openness are basically characterized with a novelty and variety seeking behaviour (McCrae & Costa, 1999; Mark, et al, 2014). They seek opportunities to try explore things, and indulge in new experiences as their interests are wide ranged (Barrick & Mount, 1991). In light of this literature we expect that Openness will be positively related to Facebook addiction, as Facebook provides its users with opportunities to a variety of experiences with new people and other online activities. These individuals are associated with intellect and intelligence therefore they become Facebook members of various online societies and groups pursuing novel interests.

Conscientiousness

Conscientious individuals are achievement driven and are characterized by strong self-discipline. They do a lot of long term planning and are focused on accomplishing them (McCrae and Costa, 1999). Since Facebook usage consumes a lot of time, these conscientious people are too focused in their lives with their own objectives that they are striving to achieve, therefore Facebook doesn't hold a very significant position in their lives, making them least likely to be suffering from Facebook addiction. Their usage of time is very structured, which doesn't allow them use of Facebook at a level that it would become an addiction.

Neuroticism

Neurotics are characterized by the feeling of anxiety, depression, hopelessness, and pessimism (McCrae and Costa, 1999). They are feeling vulnerable all the time, are mostly worried and insecure individuals (Barrick and Mount, 1991). Facebook is a forum that allows individual to participate in social networking without really physically getting involved in any social activity. Since these neurotic individuals are feeling vulnerable and insecure, therefore Facebook provides them with an opportunity to actually be sociable without exposing their anxious personality to the other members or friends on Facebook. This not only enables them to make social contacts with people on Facebook, which in real life is inhibited due to their neurotic personality but also makes them addicted to this media.

Agreeableness

Agreeableness is associated with being flexible, cooperative, and tolerant (Judge and Ilies, 2002). It is also characterized by potential to trust others, being compliant and deferring to others (Barrick and Mount, 1991). We predict that it will have a positive relation to Facebook addiction, which has a potential to be used as a medium for fostering relationships (Mark, et al 2014). Since Agreeableness is marked with a tendency to trust, we predict that Agreeableness should be positively linked with individuals' interactions on Facebook (Mark, et al, 2014).

Hypotheses justification

The fundamental purpose of the current research is to find out what personality trait is related to Facebook addiction amongst the users and how much each personality trait explains the variation in the BFAS variable. Based on this premise, an exhaustive list of hypotheses is justifiably generated, predicting the above-mentioned relationships. Based on previous exploratory research in this area, it is expected that results will confirm that big five personality traits are the predictors of Facebook addiction. We intend to study the direction of these predictions. Tremendous potential is also unearthed, to study how Facebook users from different countries despite of the same origin will have different personality traits impacting their potential of becoming Facebook addicts. Our research objectives also aim at finding out the most popular social media websites among users, the frequency of using Facebook by the users and validation of the instruments used for measuring Facebook addiction and Big 5 personality traits. A funnel approach has been incorporated starting with broad usage of social media websites, while our ultimate aim is to perform structural modelling to examine the measurement model and also test the proposed hypotheses.

Hypotheses

In light of the literature review, following hypotheses have been developed.

H1a: Saliency is negatively related to conscientiousness.

H1b: Saliency is positively related to agreeableness.

H1c: Saliency is positively related to neuroticism.

H1d: Saliency is positively related to extraversion.

H1e: Saliency is positively related to openness to experience.

H2a: Tolerance is negatively related to conscientiousness.

H2b: Tolerance is positively related to agreeableness.

H2c: Tolerance is positively related to neuroticism.

H2d: Tolerance is positively related to extraversion.

H2e: Tolerance is positively related to openness to experience.

H3a: Mood modification is negatively related to conscientiousness.

H3b: Mood modification is positively related to agreeableness.

H3c: Mood modification is positively related to neuroticism.

H3d: Mood modification is positively related to extraversion.

H3e: Mood modification is positively related to openness to experience.

H4a: Relapse is negatively related to conscientiousness.

H4b: Relapse is positively related to agreeableness.

H4c: Relapse is positively related to neuroticism.

H4d: Relapse is positively related to extraversion.

H4e: Relapse is positively related to openness to experience.

H5a: Conflict is negatively related to conscientiousness.

H5b: Conflict is negatively related to agreeableness.

H5c: Conflict is positively related to neuroticism.

H5d: Conflict is positively related to extraversion.

H5e: Conflict is positively related to openness to experience.

H6a: Withdrawal is negatively related to conscientiousness.

H6b: Withdrawal is positively related to agreeableness.

H6c: Withdrawal is positively related to neuroticism.

H6d: Withdrawal is positively related to extraversion.

H6e: Withdrawal is positively related to openness to experience.

Methodology

Data Sample and Variables

Sampling was done using convenience sampling technique and the survey was constructed on Google docs. People using Facebook whose country of origin was in South East Asia, were the absolute focus for this research. Therefore survey link was sent via emails to social media users whose country of origin was in South East Asia. It was for this purpose, convenience sampling was selected as it allows the choice of respondents based on convenience and availability (Babbie, 1990). Convenience sampling allowed the researchers to maintain focus on the sample under study and therefore the access to the survey was not provided to the entire population of Facebook users. The link was also updated as a status on Facebook to request people to fill the survey irrespective of the country of their residence. This sampling technique was used to avoid time delays and ease of data entry within the time span of two weeks. Posting the link on Facebook helped us in collecting relevant and sufficient sample. Total 343 responses were received by the deadline date. Out of which 4 were discarded on the basis of not using Facebook but other Social media websites. So our usable sample size was 339. The variables on which data was measured are shown in table 1.

Table 1: Categories of study variable

Facebook variables	addiction measurement	Big Five Personality measurement variables	Traits
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Salience	Conscientiousness
Tolerance	Extraversion
Mood Modification	Agreeableness
Relapse	Neuroticism
Withdrawal	Openness to Experience
Conflict	

Demographic characteristics of the study and other variables to Measure Facebook usage can be seen in table 2.

Table 2: Demographic Characteristics of the study

Variables	Description	Frequency	Percentage
Gender	Male	163	48.1
	Female	176	51.9
Age	18 and below	13	3.8
	19 to 25	162	47.8
	26 to 35	138	40.7
	36 to 45	19	5.6
	46 and above	7	2.1
Education	High school/O levels	12	3.5
	Intermediate/A levels	5	1.5
	Bachelors	100	29.5
	Masters	213	62.8
	Post Graduate	9	2.7
Occupation	Unemployed	17	5
	Student	127	37.5
	Professional/technical	88	26
	Manager	50	14.7
	Homemaker	25	7.4
	Service worker	19	5.6
	Teacher	9	2.7
	Other	4	1.2
	Personal Budget/Income (\$)	< 100	47
100 – 500		77	22.7
501 – 1000		75	22.1
1001 – 5000		37	10.9
5001 - 15000		56	16.5
> 15000		47	13.9
Country of residence	Pakistan	220	64.9
	USA	27	8
	Bangladesh	53	15.6
	UAE	6	1.8
	UK	6	1.8
	Australia	7	2.1
	Canada	8	2.4
	Other	12	3.6
	Preference of social media website	Facebook	306
Instagram		19	5.6
LinkedIn		5	1.5
Twitter		5	1.5
Pinterest		4	1.2
Frequency of using Facebook in a month	Many times a day	160	47.2
	Once a day	53	15.6
	Once every two or three days	41	12.1
	Once a week	39	11.5
	Once a month	21	6.2
	Less than a month	25	7.4
Using Facebook while....	While watching TV	219	64.6
	While driving	28	8.3
	While at work	170	50.1
	While travelling	157	46.3
	While lunching/dinner/breakfast	140	41.3

While in the toilet	124	36.6
All of the above together	13	3.8

Instrumentation

Brown (1993) and Griffiths (1996) have proposed six basic addiction components that are used as potential constructs for the Facebook addiction Scale. Three items for each construct were selected. Sentence structure was similar to the one that was previously used for diagnostic purposes for gambling of pathological nature (American Psychiatric Association, 2000) along with the Game Addiction Scale (Lemmens, et al, 2009). The questions were a part of a self-report questionnaire having some added questions related to demographic factors, Facebook usage, and personality. No outliers or missing values were found in the data. Thus a normal distribution of all the variables was assumed.

Table 3 presents the five-item scale (1=very often and 5=very rarely) called the Bergen Facebook Addiction Scale (BFAS) used by Andreassen, Griffiths, Hetland and Pallesen (2012) to measure Facebook addiction as a dependent variable for this particular study with their item loadings and Cronbach's alpha.

Table 3: Facebook addiction as dependent variable

Latent variable (Cronbach's alpha)	Measured variables (items)	Item loading
Salience (0.816)		
S1	I spend a lot of time thinking about Facebook or planned use of Facebook.	0.78
S2	I think about how I could spare more time to spend on Facebook.	0.73
S3	I think a lot about what has happened on Facebook recently.	0.80
Tolerance (0.827)		
T1	I spend more time on Facebook than initially intended.	0.72
T2	I feel an urge to use Facebook more and more.	0.85
T3	I feel that I have to use Facebook more and more in order to get the same pleasure from it.	0.79
Mood Modification (0.849)		
MM1	I use Facebook in order to forget about personal problems.	0.84
MM2	I use Facebook in order to reduce restlessness.	0.80
MM3	I use Facebook to reduce feelings of guilt, anxiety, helplessness, and depression.	0.79
Relapse (0.808)		
R1	I have experienced that others have told me to reduce my use of Facebook but I have not listened to them.	0.56
R2	I have tried to cut down on the use of Facebook without success.	0.98
R3	I have decided to use Facebook less frequently, but not managed to do so	0.80
Withdrawal (0.831)		
W1	I become restless, irritable, or troubled if I have been prohibited from using Facebook.	0.91
W2	I feel bad if I, for different reasons, am unable to log on to Facebook for some time.	0.78
Conflict (0.795)		
C1	I use Facebook so much that it is negatively impacting my job/studies.	0.72
C2	I give less priority to hobbies, leisure activities, and exercise because of Facebook.	0.79
C3	I ignore my partner, family members, or	0.75

friends because of Facebook.

Table 4 depicts the five-item scale (1=does not apply and 5=applies perfectly) taken from the British Household Panel Survey (BHPS) used by Yap, Anusic, and Lucas (2012) to measure Big Five Personality traits which are used as independent variables (individually) in this particular study with their item loadings and Cronbach's alpha.

Table 4: Big Five personality traits as Independent variable.

Latent variable (Cronbach's alpha)	Measured variables (items)	Item loading
Conscientiousness (0.623)		
CS1	I see myself as someone who does a thorough job.	0.65
CS2	I see myself as someone who tends to be lazy.	-.63
CS3	I see myself as someone who does things efficiently.	0.85
Agreeableness (0.631)		
A1	I see myself as someone who is sometimes rude to others.	0.66
A2	I see myself as someone who has a forgiving nature.	-0.81
A3	I see myself as someone who is considerate and kind to almost everyone.	-0.61
Neuroticism (0.708)		
N1	I see myself as someone who worries a lot.	0.70
N2	I see myself as someone who gets nervous easily.	0.73
N3	I see myself as someone who is relaxed and can handle stress well.	-0.74
Extraversion (0.631)		
EE1	I see myself as someone who is outgoing and sociable.	0.85
EE2	I see myself as someone who is reserved.	-0.76
Openness to Experience (0.915)		
OtoE1	I see myself as someone who is original and come up with new ideas.	0.77
OtoE2	I see myself as someone who values artistic and aesthetic experiences.	0.83
OtoE3	I see myself as someone who has an active imagination.	0.80

Analysis

The data was examined for reliability and validity. These tests are important as recommended by Shah and Goldstein (2006).

Confirmatory Factor Analysis

After loading each item and then testing them first; carried out CFA. All the items were retained because all of them were interlinked with each other and dropping any one of them would have disturbed the results. There was no correlation amongst the error terms of each item with other items. The model fit of several indices can be seen in table 5. It is always suggested to use a mix of them since each of it has their own weaknesses and strengths (Kline, 2005; Hu and Bentler, 1999).

Table 5: Model Fit Summary for Confirmatory Factor Analysis

Index	Recommended Value	Observed Value
Chi-	1 to 3 (Segars and Grover, 1998)	1.598

square/df		
NFI	Greater than 0.8 (Segars and Grover, 1998), greater than 0.9	0.887
GFI	(Byrne et al, 1989)	0.913
CFI		0.954
TLI		0.943
RMSEA	Score less than 0.10 (Hair et al., 2006)	0.042

Structural Equation Modelling

SEM was performed using AMOS 18. It was performed to determine which personality trait predicted the Facebook addiction and with what intensity. Facebook addiction components factor were treated as latent endogenous variable as specified by Griffiths (2005); the respective personality trait factors were used as exogenous latent variables. Maximum likelihood estimation was used as the data were distributed normally (Kline, 2005). No missing values were found in the data.

Results

Measurement Model

Structural Equation Modelling was performed to examine the measurement model and test the proposed hypotheses. Shah and Goldstein (2006) established a three-stage approach to confirm the reliability, uni-dimensionality, and validity.

Stage 1: Reliability Testing

Reliability was tested using average variance extracted (convergent reliability) and construct reliability (also called composite reliability). As a common practice, the generally acceptable levels of analysis show a composite reliability of more than 0.7 and the AVE of more than 0.5 (Salman et al., 2014). Table 6 shows the reliability values of each construct.

Table 6: Reliability of constructs

Constructs	Convergent Reliability (AVE)	Construct Reliability	Discriminant Validity
Salience	0.597	0.816	0.245 (holds)
Tolerance	0.622	0.831	0.205 (holds)
Mood Modification	0.652	0.849	0.093 (holds)
Relapse	0.639	0.835	0.108 (holds)
Conflict	0.566	0.796	0.116 (holds)
Withdrawal	0.720	0.836	0.003 (holds)
Conscientiousness	0.568	0.764	0.114 (holds)
Agreeableness	0.608	0.724	0.233 (holds)
Neuroticism	0.516	0.665	0.108 (holds)
Extraversion	0.992	0.454	0.355 (holds)
Openness to Experience	0.659	0.354	0.250 (holds)

Stage 2: Uni-dimensionality Testing

The aim of this test is to determine whether the items in the scale belong to a single underlying construct (Venkatraman and Grant, 1986). The results specify that there is no uni-dimensionality (Chi-square p-value=0.000, $X^2/df=1.59$, GFI=0.913, NFI=0.887, TLI=0.943, CFI=0.954 and RMSEA=0.04).

Stage 3: Validity Testing

Validity is tested using Discriminant validity. It is the extent to which the constructs are dissimilar to each other (John and Reve, 1982). It was tested using Fornell and Larcker's (1981) suggested technique, where convergent reliability is compared with the average shared variance (which is the average of squared correlation of all the constructs). This value should be smaller than the value of AVE. The results can be seen in table 6.

Correlational Analysis

After identifying the reliable and validated structures for all the constructs, each of the BFAS constructs were examined in light of their correlations with each of the Big Five Personality Traits. Please see appendix 1 for the correlation matrix. We can see that not all traits are significantly correlated with the BFAS variables. Relapse and conscientiousness are significantly correlated with each other. Extraversion is significantly correlated with Mood modification and Conflict variables of Facebook addiction. Neuroticism and Relapse are significantly positively correlated as well.

Structural Equation Modelling

Table 7 summarizes the results of our structural model. A total of 30 hypotheses were tested. All the variables were retained.

*Table 7: Coefficients of Structural model *p<0.01 **p<0.001*

Path	Coefficients
H _{1a} : Salience is negatively related to conscientiousness.	-0.31**
H _{1b} : Salience is positively related to agreeableness.	0.878**
H _{1c} : Salience is positively related to neuroticism.	-0.235*
H _{1d} : Salience is positively related to extraversion.	0.104**
H _{1e} : Salience is positively related to openness to experience.	0.384**
H _{2a} : Tolerance is negatively related to conscientiousness.	-0.024*
H _{2b} : Tolerance is positively related to agreeableness.	0.935**
H _{2c} : Tolerance is positively related to neuroticism.	-0.21
H _{2d} : Tolerance is positively related to extraversion.	0.056*
H _{2e} : Tolerance is positively related to openness to experience.	0.540**
H _{3a} : Mood modification is negatively related to conscientiousness.	0.005
H _{3b} : Mood modification is positively related to agreeableness.	0.643*
H _{3c} : Mood modification is positively related to neuroticism.	-0.032
H _{3d} : Mood modification is positively related to extraversion.	0.052
H _{3e} : Mood modification is positively related to openness to experience.	0.259*
H _{4a} : Relapse is negatively related to conscientiousness.	0.009
H _{4b} : Relapse is positively related to agreeableness.	0.577*
H _{4c} : Relapse is positively related to neuroticism.	0.235
H _{4d} : Relapse is positively related to extraversion.	-0.05
H _{4e} : Relapse is positively related to openness to experience.	-0.432*
H _{5a} : Conflict is negatively related to conscientiousness.	-0.017*
H _{5b} : Conflict is negatively related to agreeableness.	-0.817*
H _{5c} : Conflict is positively related to neuroticism.	0.315**
H _{5d} : Conflict is positively related to extraversion.	0.05
H _{5e} : Conflict is positively related to openness to experience.	0.661**
H _{6a} : Withdrawal is negatively related to conscientiousness.	-0.620**
H _{6b} : Withdrawal is positively related to agreeableness.	0.820**
H _{6c} : Withdrawal is positively related to neuroticism.	0.231*
H _{6d} : Withdrawal is positively related to extraversion.	0.015
H _{6e} : Withdrawal is positively related to openness to experience.	0.432*

Salience

Insignificant result was seen between salience and neuroticism (H_{2c}). H_{2a}, H_{2b}, H_{2d}, and H_{2e} produced statistically significant results out of which salience and agreeableness (H_{2b}) demonstrated to be highly statistically significant with highest coefficient value of 0.935 (p<0.001).

Mood Modification

Mood modification was found to be statistically significant with only agreeableness and openness to experience. All other traits showed insignificant results. Agreeableness and openness to experience were statistically significant on mood modification with path weights of 0.643 and 0.259 (both p<0.01).

Relapse

Statistically significant results were found between relapse and agreeableness (h_{4b}) with path weight of .577 ($p < 0.01$) and relapse and openness to experience (H_{4c}). The literature focused on positive relation between relapse and openness to experience whereas our findings gave opposite but significant results of path weight of -0.432 ($p < 0.01$). H_{4a} , H_{4c} , and H_{4d} were statistically insignificant.

Conflict

We found support for H_{5a} , H_{5b} , H_{5c} , and H_{5e} . Insignificant results were found between conflict and extraversion. Agreeableness and conflict showed the highest path weight value of -0.817 ($p < 0.01$). It means that conflict and agreeableness are negatively related. Highly significant results can be seen between conflict and openness to experience with path weight of 0.661 ($p < 0.001$).

Withdrawal

Withdrawal was found to be statistically insignificant with extraversion. We found support for H_{6a} , H_{6b} , H_{6c} , and H_{6e} . The highest path weight was found to be 0.820 ($p < 0.001$) between withdrawal and agreeableness. Conscientiousness and withdrawal were also highly significant with beta value of -0.620 ($p < 0.001$), which means that they are inversely related. Table 8 shows the model fit summary of the final model which shows a good fit for the entire model indices.

Table 8: Model Fit Summary for Final Model of Structural equation

Index	Recommended Value	Observed Value
Chi-square/df	1 to 3 (Segars and Grover, 1998)	1.796
NFI	Greater than 0.8 (Segars and Grover, 1998), greater than	0.864
GFI	0.9 (Byrne, 1989)	0.896
CFI		0.934
TLI		0.924
RMSEA	Score less than 0.10 (Hair et al., 2006)	0.049

Discussion and Implication

The results of this study maintained the outcome of literature that Facebook addiction can be predicted through big five personality traits of a human. The study was conducted with an aim to develop and test the model of relationship between Facebook addiction and the five personality traits. The variables were picked from previous studies done in this area. Correlational analysis was done to highlight which BFAS variable was highly correlated with which big five-personality traits variable. Then SEM was performed considering BFAS measures as separate endogenous variables (6 in total) and big five personality traits as exogenous variables (5 in total) separately. No variable was dropped due to very good factor loadings (all above .60).

Facebook addiction measures and Conscientiousness

Conscientiousness seems to be negatively related to Internet use in general, because conscientious individuals seem to be more dutiful in their everyday (offline) tasks and tend to regard the Internet (and Facebook possibly even more) as an unwanted distraction from their daily routine, which might lead to less engagement in online activities (Stieger et al., 2013). According to literature, highly conscientious people think of social media as a distraction from other more important tasks, so a negatively relation between Facebook addiction and conscientiousness was expected which has been proved by our study. Facebook addiction and conscientiousness is negatively related to each other. Users who are high on Facebook addiction will not be worried about the work ethics and orderliness in their life and the current research confirms it.

Facebook addiction measures and Agreeableness

Kayaş et al (2016) established a positive relationship between Internet addiction and agreeableness trait of personality. It is noted that people who are high in agreeableness offer help easily and expect reciprocity (Akter et.al, 2016). However, in case of the variable 'conflict' measuring Facebook addiction the relationship is negative which is quite obvious. Our study seconds the literature and has proved that users who are high on Facebook addiction are high on agreeableness trait of personality. They are friendly, kind, and warm (Costa and McCrae, 1999). Whereas people who are high on the variable conflict will be less agreeable, thus a negative but highly significant relationship is confirmed.

Facebook addiction measures and Neuroticism

Psychological traits such as leisure, boredom (Hong et al., 2014), loneliness (Zhao et al., 2008), and neuroticism (Chen, 2008; Chen et al., 2008; La Barbera et al., 2009; Meerkerk et al., 2006) are related to addiction to SNSs. Those who score high for Neuroticism utilize the online forums as a method to reduce feelings of loneliness and create a sense of belonging to a group (Butt and Phillips, 2008; Amichai-Hamburger and Ben-Artzi, 2003; Hughes, D. J., Rowe, M., Batey, M., and Lee, A. (2012). It was expected that Facebook addiction would be positively related to Neuroticism. Overall, withdrawal, conflict and relapse produced positive results whereas all other produced negative relation between Facebook addiction and Neuroticism. So we can say that Neuroticism is not a reliable measure of measuring Facebook addiction.

Facebook addiction measures and Extraversion

According to literature, extroverts tend to make the friends in real life and then utilize the Internet to stay in touch (Ross et al., 2009). So they were expected to be highly related with each other. High extraversion can significantly predict the inclination toward addiction and the time spent on SNSs, which shows that extroverts can satisfy their needs when using SNSs. (Wilson et al., 2010). Our study produced mostly insignificant results for most of the variables measuring Facebook addiction and extraversion. Only salience proved to be highly significant in this case. As salient people are thinkers and they try to maintain their relationships with people, extroverts are doing the same i.e. social enhancement.

Facebook addiction measures and Openness to experience

Openness has been shown to correlate with the use of wider variety of Facebook features (Amichai-Hamburger and Vinitzky, 2010). Research has shown that since people open to experience will have more friends, Facebook users may be more open (Correa et al., 2010; Ross et al., 2009). So, it is expected that positive relation will be observed between both the variables. Our study added in the results of the previous researches done and openness to experience was proved to be positively related to Facebook addiction.

Limitations

A number of limitations should be kept in mind while reading the results of this study. Firstly a sample bias might have been caused due to the recruitment method employed in the research, and the sample might constitute above average proportion of heavy Internet users. Additionally, since the respondents were attracted from Facebook and other forums on Internet, therefore the sample may contain a large number of individuals who take pleasure in online social interaction. Secondly if the time frame of data collection was increased, more responses could have been analysed (time frame used in data collection was 4 weeks). Lastly for personality trait measures, more variables could have been analysed for better and consistent results.

Future Research

Exploring second order constructs in Facebook addiction can further enrich the current research of gauging Facebook addiction. Moreover, it will be interesting to see the impact of demographic variables as moderating or mediating variables in the current study. Further

more relationship of parenting and academic performance can also unravel the causes of Facebook addiction.

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Appendix

	S1	S2	S3	T1	T2	T3	MM1	MM2	MM3	R1	R2	R3	W1	W2	C1	C2	C3	CS1	CS2	CS3	EE1	EE2	EE3	A1	A2	A3	N1	N2	N3	O1	O2	O3
S1	1																															
S2	.574**	1																														
S3	.619**	.596**	1																													
T1	.565**	.359**	.509**	1																												
T2	.574**	.506**	.594**	.645**	1																											
T3	.521**	.561**	.594**	.526**	.670**	1																										
MM1	.380**	.443**	.361**	.352**	.454**	.466**	1																									
MM2	.325**	.355**	.319**	.329**	.438**	.428**	.654**	1																								
MM3	.330**	.360**	.279**	.318**	.404**	.384**	.669**	.634**	1																							
R1	.391**	.416**	.368**	.306**	.382**	.416**	.321**	.345**	.392**	1																						
R2	.374**	.327**	.350**	.339**	.413**	.377**	.252**	.292**	.268**	.543**	1																					
R3	.264**	.225**	.240**	.243**	.256**	.211**	.120**	.131**	.104**	.424**	.788**	1																				
W1	.497**	.436**	.484**	.429**	.540**	.525**	.380**	.309**	.340**	.517**	.487**	.347**	1																			
W2	.450**	.433**	.473**	.456**	.490**	.450**	.317**	.284**	.360**	.422**	.375**	.184**	.712**	1																		
C1	.368**	.348**	.318**	.334**	.385**	.388**	.334**	.270**	.320**	.509**	.407**	.295**	.529**	.456**	1																	
C2	.417**	.391**	.415**	.417**	.479**	.447**	.409**	.384**	.368**	.442**	.370**	.286**	.530**	.441**	.557**	1																
C3	.352**	.288**	.371**	.397**	.456**	.437**	.310**	.284**	.354**	.544**	.395**	.264**	.509**	.397**	.538**	.598**	1															
CS1	-.015	-.004	-.054	-.053	-.056	-.032	-.068	-.032	.004	-.010	-.047	-.032	-.048	.009	-.033	.016	-.016	1														
CS2	.020	.117*	-.017	.081	.068	.032	.032	.000	.004	.139*	.062	.107*	.080	.041	.036	.038	.076	.350**	1													
CS3	-.032	-.016	-.033	-.013	-.034	.047	.012	-.004	.025	-.043	.055	.028	-.044	-.030	.040	.006	-.062	.556**	.454*	1												
EE1	-.071	.000	.036	-.086	-.094	-.053	-.057	-.060	-.131*	-.062	.018	.042	-.038	-.112*	-.103	-.119*	-.122*	-.062	.100	-.116*	1											
EE2	.084	.123*	.094	.029	.062	.058	.079	.029	.049	.118*	-.064	-.036	.045	.050	.044	.035	.070	-.101	.031	-.091	.048	1										
EE3	-.079	-.092	-.061	-.017	-.063	-.020	-.068	-.034	-.035	-.106	.042	.022	-.075	-.068	-.050	-.038	-.042	.098	-.014	.069	-.075	.858*	1									
A1	.033	-.002	-.051	.012	.031	.063	.094	.059	.054	.041	.062	.028	.090	.062	-.018	.019	.054	-.063	-.017	-.041	-.011	.013	-.006	1								
A2	-.012	.017	-.016	.011	-.026	-.031	-.042	-.062	-.026	-.024	-.043	-.057	-.027	.052	.014	.033	-.056	.017	-.106	.020	.005	.032	-.015	.185*	1							
A3	-.067	-.001	-.093	-.028	-.097	-.101	-.059	-.061	-.088	-.030	-.017	.005	-.078	-.039	-.044	-.104	-.063	.023	.014	-.026	.043	.034	-.015	-.092	.416**	1						
N1	-.056	-.048	-.053	-.070	.001	.009	.074	.023	.027	.010	.112*	.134*	.059	.000	-.024	.022	.082	.045	.037	.032	.054	-.029	.045	.117*	-.085	-.054	1					
N2	-.042	.029	.002	-.043	.015	.006	-.003	.009	-.050	-.038	.058	.119*	.001	-.014	-.009	.009	-.005	.014	.000	-.007	-.031	-.027	.071	-.013	-.093	-.047	.088	1				
N3	-.027	-.006	.070	.018	-.048	.022	.022	.062	.043	-.062	.022	.059	.018	-.014	-.031	-.019	-.023	-.082	.019	.007	.013	-.117*	.117*	.031	.037	-.055	-.039	.091	1			
O1	-.004	-.109*	.043	-.019	.010	.021	-.044	-.050	-.059	-.087	-.092	-.079	-.061	-.088	-.038	-.001	-.019	.037	-.122*	.004	.102	.055	-.059	.026	.059	.025	-.037	-.088	.082	1		
O2	.038	-.050	.035	.038	.073	.099	.014	.009	-.052	-.068	-.074	-.079	-.037	-.095	-.031	.007	-.023	.064	-.120	.058	.086	.045	-.050	.009	.078	.036	-.041	-.132*	.038	.778**	1	
O3	.044	-.085	.021	-.014	.019	.034	-.017	-.005	-.030	-.082	-.088	-.105	-.034	-.078	-.005	.030	-.003	.039	-.121*	.046	.079	.025	-.047	.036	.062	.046	-.070	-.067	.007	.812**	.756**	1