DEVELOPING A SMARTPHONE DEPENDENCY SCALE FOR UNIVERSITY STUDENTS IN INDIA: A CONFIRMATORY FACTOR ANALYTIC APPROACH

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Abstract *Smartphones are used not only for fundamental purposes like calling and messaging but also for a host of other useful functions. India surpassed the USA in terms of smartphone users in 2017 with an estimated smartphone user base of 340 million. There is lack of a comprehensive study that examines the concept of smartphone dependency in the context of youth in India. Researchers decided to consider university student as the unit of analysis for the current study, since they are the primary adopters of innovative technology like smartphones. Convenience sampling was employed to select the desired sample from the central universities. Survey instrument was developed from scales suggested by previous researchers and administered personally by the researchers. Results revealed, probably for the first time in Indian context, that hedonism and habit were relevant in the context of smartphone dependency along with social needs, social influence and convenience. Confirmatory Factor Analysis resulted in a parsimonious scale consisting of 21 items. Results are crucial for both academicians and marketers. The study findings indicate that marketers need to emphasise on features like larger memory space, more interactive interface, greater data transfer speed, easier connectivity to devices and enhanced facility to access documents.*

Keywords: *Smartphone, Addiction, CFA, Scale, Youth, India*

INTRODUCTION

Mobile devices have become a rage and have emerged as an important tool for customers due to the rapid growth of wireless communication. Today, mobile phones are used not only for fundamental purposes like calling and messaging but also for a host of other useful functions and thus they are aptly known as smartphones (Harun, Soon, Kassim & Sulong, 2015). The smartphones have acted as catalysts in fuelling growth in mobile usage and have gone much ahead of their primary role of being a communication tool (Chou, Chiu, Ho & Lee, 2013).

Smartphones, in fact, have stepped up to become the extension of the personality of the users (Persuad & Azhar, 2012; Chou et al., 2013). They not only facilitate the users to stay in touch with people but also to express attitude, feelings and interests (Chou et al., 2013). Smartphone users also use mobile services (m-services) or apps for information search, online transactions, accessing social media platforms and online shopping (Huh & Kim 2008; Kleijnen, De Reytur & Wetzels, 2007). Smartphone, through its numerous applications or apps, enables prompt access to the Internet, social media and online shopping platforms

(Aljomaa, Qudah, Albursan, Bakhiet & Abduljabbar, 2016). This has made users dependent on smartphones because of convenience, amazing camera features, easy installation of apps and primarily because it can perform most of the functions of a computer on the go (Harun et al., 2015). Smartphones are significantly affecting the lives of people, their search and shopping pattern, and how they connect to the rest of the world (Goldman, 2010). There has been a continuous increase in the demand because of the attractiveness and utilities offered by smartphones (Park & Chen, 2007).

Globally, the number of smartphone users is expected to grow from 2.1 billion in 2016 to around 2.87 billion in 2020, accompanied by increasing smartphone penetration rates as well (Statista.com, 2018a). Also, around 50 percent of the world's population is estimated to own a smartphone by 2018, an increase of about 26 percent from 2011 (Statista.com, 2018a). China, the world's most populated country, is the leader in terms of smartphone users as well. It is estimated that nearly half of the Chinese population would be using a smartphone by 2020 (Statista.com, 2018a). The smartphone users in China are projected to be around 675 million in 2019 (Statista.com, 2018a). The United States

also has a large base of smartphone users, with around 223 million smartphone users in 2017, which is expected to increase up to 247.5 million by 2019 (Statista.com, 2018a).

The smartphone industry in India is growing with a steady pace and around 36 percent of all mobile users in India are expected to own a smartphone by the end of 2018 (Statista.com, 2018b). India surpassed the USA in terms of smartphone users in 2017 with an estimated smartphone user base of 340 million (www.businesstoday.in, 2017). The growth of Internet-based smartphones has brought about a path-breaking change in the society. Most users prefer smartphone over conventional phones due to its convenience, amazing features, fast and easy installation of applications, and also because it can perform most of the computer functions (Harun et al., 2015). The association of humans and smartphones has been stated to be an increasingly enduring one (Farnsworth & Austrin, 2010). Smura, Kivi and Toyli (2009) stated that mobile phones have slowly become an integral part of consumer lifestyle. The functionality of a smartphone helps users in their everyday affairs, particularly the business people and university students (Suki, 2013a). Jacob and Isaac (2014) pointed that the university students form one of the largest pools of smartphone users. Hence, the present study attempts to explore and assess students' usage behaviour and dependence on smartphones and its policy implications.

Review of Literature

Balakrishnan and Raj (2012) stated that mobile phones may be considered to be the extension of customers' personality. The present-day smartphones have better in-built features making them more interactive. Wei (2008) opined that smartphones have gone beyond voice. Dresler-Hawke and Mansvelt (2008) opined that the smartphone has emerged to be an integral part of social interaction of today's youth. The consumers keep in touch with each other through these online social interactions, even on the go, with the help of their smartphones.

Mobile phone addiction has been studied and its impact examined in various areas like academic and workplace performance (Ezoe, Toda, Yoshimura, Naritomi, Den & Morimoto, 2009; Javid, Malik & Gujjar, 2011). With the advent of technology, the mobile phones have metamorphosed into smartphones, which offer a plethora of functions which include instant messaging, social networking, gaming and entertainment (Ting, Lim, Patanmacia, Low & Ker, 2011). One of the primary drivers for smartphone dependency is its ability to offer Internet-based functions such as surfing, browsing and online shopping and as a result smartphone emerged as one of the most potent shopping platforms (Hubert, Blut, Brock, Backhaus & Eberhardt, 2017). Park, Kim, Shon and Shim (2013) suggested that

though consumers find smartphones easy to use, they use it only when they find it useful too. Perceived usefulness and perceived ease of use have been found to positively affect smartphone addiction. These findings further prove that smartphone is a successful tool and consumers think it to be an essential medium for communication.

A number of researches have also focused on smartphone dependency and how it affects the behaviour of users (Al-Barashdi, Bouazza & Jabr, 2014; Arif, Aslam & Ali, 2016; Lee, Kim, Ha, Yoo, Han, Jung & Jang, 2016). Researchers in various countries like Taiwan (Lin, Chang, Lee, Tseng, Kuo & Chen, 2014; Lin, Lin, Lee, Lin, Lin, Chang & Kuo, 2015), Korea (Cho and Lee, 2015; Kwon, Kim, Cho & Yang, 2013), India (Davey & Davey, 2014) and the USA (Roberts, Yaya & Manolis, 2014; Smetaniuk, 2014) have observed that smartphone dependency and purchase behaviour are highly correlated. These research works were essentially dedicated to the development of a framework to assess smartphone addiction.

Suki and Suki (2013) observed the dependency of students on smartphones and how it is affected by factors like social needs, social influences and convenience. Social needs had the strongest impact on students' dependence on smartphones, followed by convenience and social influence. The study also elucidated a positive association between students' dependence on smartphone and their purchase behaviour. In another study, Ting et al. (2011) found that social influences, social needs and convenience influence smartphone dependency in students, which in turn is positively correlated with purchase behaviour. Aykanat, Yildiz and Celik (2016) observed product features and price, brand name, social influence and social need have significant impact on smartphone dependency. This study relied on a sample of university students and revealed a positive relationship between factors - social influence and social needs - and smartphone dependence. The study also suggested that product price negatively affects smartphone dependence. Arif et al. (2016), in one of the significant studies on smartphone dependence, found factors like social needs, social influence and convenience to be influencing smartphone dependency. They also established a positive relationship between smartphone dependence and purchase behaviour of students. Kim and Shin (2016) also found that social influences and social needs positively impacted dependency on smartphone, which in turn affected customer satisfaction and loyalty. The researchers suggested that companies may utilise this addiction to create satisfied and loyal customers.

Enjoyment has been established as a crucial research area in the field of information systems research (Sanakulov & Karjaluoto, 2015; Tojib & Tsarenko, 2012). In fact, many hedonic studies in the field of information technology have suggested that people who get involved at a hedonic level

while using a technology have a higher tendency of addiction (Chou & Ting, 2003; Yang, Wang & Lu, 2016). Habit has also been found to play a significant role in smartphone addiction. Lee et al. (2014) stated that habit influences both proximal Information System (IS) use as well as distal IS usage behaviour. Habit has been found to be an important factor that helps in explaining behaviours (Chen, Zhang & Zhao, 2015).

Based on the in-depth review of literature, the researchers have identified five factors that have been found to significantly influence the students' dependence on smartphones:

Social Needs

Social needs mean the necessity to connect and communicate with others (Harun et al., 2015). They consist of need for love, affection, belonging and acceptance (Schiffman, Kanuk & Wisenbut, 2009). Social need is the requirement of social interaction of a consumer, which signifies the need for staying connected with friends, family and other social groups (Tikkanen, 2009). This is facilitated by present-day smartphones that are loaded with social networking applications (Ting et al., 2011), which enable the consumers in promptly connecting to their social groups. Social needs arise after the physiological and safety needs of an individual are fulfilled. Smartphone devices are equipped with different software, which enable the consumers to interact with their social circles readily and on the go (Carayannis, Clark & Valvi, 2012). Smartphones have better screen resolution and deliver several enticing functions like web browsing, app downloads, e-mailing, instant messaging, enhanced camera, photo sharing, video and audio playback, GPS navigation, games and much more (Goldman, 2010). The smartphones are now extremely versatile, which enables the consumers to increasingly use them for connecting and communicating with their social groups, thereby proving social need to be a crucial factor of smartphone dependency (Lippincott, 2010). Ting et al. (2011) also stated that smartphones are primarily used to satisfy social needs, i.e., need for interacting with social circles and groups. Smartphones help them stay connected through instant chat feature of the smartphones and provide prompt access to social networking sites. Ting et al. (2011) established a significant positive association between social needs and dependence on the smartphone.

Social Influence

Social influence is the effect of other people on an individual's beliefs, views and behaviour (Mason, Conrey & Smith, 2007). People are generally not conscious of the effect of social influences on their personality and it has been established that it positively impacts an individual's tendency

to be dependent on smartphones (Klobas & Clyde, 2001). Consumers are prone to be influenced by the opinions, views or expectations of others with regard to their engagement with the smartphones (Suki & Suki, 2007). Smartphone users are influenced by their social groups and family members who are considered crucial in forming smartphone dependency (Auter, 2007). Schiffman et al. (2009) noted that consumer's evaluation and adoption of product is also influenced by their social class, culture and subculture, thus reiterating the effect of social influence. Social expectations and practices influence consumer's attitude towards a brand and also impact the buying intentions (Jamil & Wong, 2010). On the other hand, smartphone dependency increases if it creates a positive impression in social circles and garners appreciation from them, thus creating a rippling effect on other users (Ting et al., 2011). Social influence has been described to have a positive association with dependence on smartphone (Ting et al., 2011).

Convenience

Convenience is everything that provides comfort or saves effort and is useful, handy or helpful whether it's a device, article or service (Harun et al., 2015). Convenience is a multi-dimensional concept which, the researchers have recommended, has six stages. The six proposed stages are time utilisation, accessibility, portability, appropriateness, handiness and avoidance of unpleasantness (Brown, 1990). Holub, Green and Valenti (2010) advocated that today's smartphone is transportable, fixed with an individual and not a static terminal. Consumers can use smartphones in situations that have severe time and space constraints, unlike a desktop or laptop (Lu & Su, 2009). Stephen & Davis (2009) proposed that today's smartphones are basically a convenient combination of simple mobile phone and laptops. The innumerable functions that the two devices (mobile and desktop) used to perform have actually propelled the usage rate of smartphones (Hahn, 2010). Consumers conveniently sift through their e-mails, connect to social media websites, and chat online on their smartphones on the go (Hudson, 2010). Users nowadays are heavily reliant on their smartphones as constantly explore information by a mere touch which is much convenient than before (Genova, 2010). Ting et al. (2011) have also showed that convenience positively impacted consumer's dependency on smartphones.

Hedonism

Hedonism is one of the three primary constituents (hedonic value, utilitarian value and social value) of consumer value (Rintamäki, Kanto, Kuusela & Spence, 2006). The concept of perceived hedonic value is defined as the sum

total of experienced arousal, experiences gained (social, cognitive and emotional) and perceived independence (Kazakeviciute & Banyte, 2012). Hedonic shopping motives may be compared to utilitarian shopping motives, the only difference being that the task orientation is related to feeling of fun, amusement and sensory stimulation (Babin, Darden & Griffin, 1994; Arnold & Reynolds 2003). Hedonism has been studied extensively vis-à-vis offline shopping (Babin & Attaway, 2000; Darden & Reynolds, 1971) and has also been identified as critical element of online shopping (Kuan, Bock & Vathanophas 2008; Gupta & Kim, 2010; Kim, Galliers, Shin, Ryoo & Kim, 2012; Rahman, Ahmad & Khan, 2017). Hedonism as also been studied in the context of information systems by various scholars and has been found to have significant influence on consumer's behaviour (Ahmad, Rahman & Khan, 2017). It is possible that this is true for smartphone usage too as hedonism has been found to be a critical factor in the usage of mobile devices (Wakefield & Whitten, 2006). Chen et al. (2015) have studied the role of perceived enjoyment (hedonism) in the context of smartphone addiction and found that users who primarily use value-added functions (surfing, browsing & online shopping) of smartphone may experience higher enjoyment levels. The authors also predicted that such users slowly develop smartphone dependency.

Habit

Venkatesh, Thong and Xu (2012) described habit as 'the extent to which people tend to perform behaviours automatically because of learning'. It has been found that personal habit impacts IS continuance (Limayem, Hirt & Chin, 2001). Researchers have explained that previous habitual behaviours can induce positive feelings towards behaviour, thus increasing intention to continue (Kim & Malhotra, 2005; Limayem, Hirt & Cheung, 2007). Intention and habit have been considered as major antecedents of behaviour, especially in the context of information systems (Limayem et al., 2007; Bhattacherjee, Limayem & Cheung, 2012; Venkatesh et al., 2012). People who use electronic devices habitually have the tendency to accept innovative technologies even before using it (Venkatesh & Zhang, 2010). This relationship is established by various studies in the area of information systems (Kolodinsky, Hogarth & Hilgert, 2004; Eriksson, Kerem & Nilsson, 2008). Habit is found to influence the continuance behaviour in e-commerce (Liao, Palvia & Lin, 2006). Khalifa & Liu (2007) revealed that the habit of online shopping positively affects the repurchase intention of the consumers. Raman & Don (2013), on the other hand, have found no significant relationship between habit and behaviour. In the present study, it was theorized that if the use of the smartphone becomes habitual to students, they will have the tendency to be dependent on it. A summary of the major studies in the area of smartphone usage and addiction is compiled in Table 1.

Table 1: Review of Major Studies on Smartphone Dependency*

S. No.	Author	Year	Country	Sample Population	Statistical Analysis
1.	J. K. Nayak	2018	India	Students	Structural Equation Modelling
2.	Gokcearslan et al.	2018	Turkey	Students	Structural Equation Modelling
3.	Jiang & Li	2018	China	Students	Structural Equation Modelling
4.	Lee & Lee	2017	South Korea	Students	Regression Analysis
5.	Chen et al.	2017	China	Students	Structural Equation Modelling
6.	Hawi & Samaha	2017	Lebanon	Students	Binary Logistic Regression & Structural Equation Modelling
7.	King & Dong	2017	USA	Students	Structural Equation Modelling
8.	Kwon & Paek	2016	Korea	Students	Hierarchical Multiple Regression
9.	Lee & Shin	2016	US & South Korea	Students	Structural Equation Modelling
10.	Aykanat et al.	2016	Turkey	Students	Structural Equation Modelling
11.	Ezoe et al.	2016	Japan	Students	Exploratory Factor Analysis
12.	Yehuda et al.	2016	Israel	Students	Multivariate Regression
13.	Lian et al.	2016	China	Students	Independent Samples t-Test & Bivariate Correlation Analysis
14.	Pavia et al.	2016	Italy	Students	Confirmatory Factor Analysis
15.	Aljomaa et al.	2016	Saudi Arabia	Students	Independent Samples t-Test, ANOVA & Bonferroni Test
16.	Gokcearslan et al.	2016	Turkey	Students	Structural Equation Modelling
17.	Lee et al.	2016	South Korea	Students	Mann-Whitney U-test & Pearson's Chi-square test
18.	Houng et al.	2016	South Korea	Senior Citizens	Factor Analysis & Independent Samples t-Test
19.	Arif et al.	2016	Pakistan	Students	Structural Equation Modelling
20.	Bisen & Deshpande	2016	India	Students	Descriptive Statistics & Independent Samples t-Test

S. No.	Author	Year	Country	Sample Population	Statistical Analysis
21.	Kim & Shin	2016	South Korea	General Population	Structural Equation Modelling
22.	Gokcearslan et al.	2016	Turkey	Students	Structural Equation Modelling
23.	Long et al.	2016	China	Students	Logistic Regression Analysis
24.	Samaha & Hawi	2016	Lebanon	Students	Correlation
25.	Wang Y.	2016	Taiwan	Tourists	Correlation & Regression
26.	Harun et al.	2015	Malaysia	General Population	Structural Equation Modelling
27.	Shin & Lee	2015	US & South Korea	Students	Path Analysis
28.	Kim et al.	2015	South Korea	Students	Hierarchical Regression Analysis
29.	Chen et al.	2015	China	Students	Structural Equation Modelling
30.	Lin et al.	2015	Singapore	Students	t-Test & Correlation
31.	Haug et al.	2015	Switzerland	Students	Logistic Regression Analysis
32.	Demirci et al.	2015	Turkey	Students	t-Test, Correlation & Linear Regression
33.	Roberts et al.	2015	US	Students	Structural Equation Modelling
34.	Van Deursen et al.	2015	Netherlands	General Population	Structural Equation Modelling
35.	Chiu S.	2014	Taiwan	Students	Structural Equation Modelling
36.	Roberts et al.	2014	US	Students	Structural Equation Modelling
37.	Demirci et al.	2014	Turkey	Students	Exploratory Factor Analysis
38.	Bian & Leung	2014	China	Students	Exploratory Factor Analysis
39.	Arif & Aslam	2014	Pakistan	Students	Exploratory Factor Analysis
40.	Lee et al.	2014	Taiwan	General Population	Structural Equation Modelling
41.	Lee et al.	2014	Korea	Students	Independent Samples t-Test & Welch-Aspin test
42.	Suki	2013	Malaysia	Students	Structural Equation Modelling
43.	Suki	2013	Malaysia	Students	Exploratory Factor Analysis
44.	Lee W.	2013	South Korea	Students	t-Test, ANOVA & Pearson Correlation Coefficient
45.	Kwon et al.	2013	South Korea	Students	t-Test, ANOVA & Correlation Analysis
46.	Salehan & Nigahban	2013	US	Students	Structural Equation Modelling
47.	Park et al.	2013	South Korea	General Population	Structural Equation Modelling
48.	Persaud & Azhar	2012	Canada	General Population	ANOVA & Regression Analysis
49.	Park & Lee	2012	South Korea	Students	Hierarchical Regression Analysis & Correlation Analysis
50.	Chun et al.	2012	South Korea	Students	Structural Equation Modelling
51.	Ting et al.	2011	Malaysia	Students	Structural Equation Modelling
52.	Emanuel et al.	2011	US	Students	Descriptive Statistics
53.	Park & Lee	2011	Korea	General Population	Structural Equation Modelling
54.	Verkasolo	2010	Finland	General Population	Confirmatory Factor Analysis

*Prepared by the Researchers

It is clear from the review of extant literature that studies related to smartphone addiction or dependency has primarily focused on the behavioural aspects of users. A significant body of available literature shows that research studies have focused on factors like social needs, social influences and convenience, which may be referred to as the *classical*

factors, whereas others have taken into consideration the emerging factors like hedonism and habit formation. There is a dearth of researches which have considered all these factors together, though they have been studied separately. Also, majority of the previous studies on smartphone users have focused on student populations, which is logical as they tend to be early adopters. There is lack of a comprehensive study, which examines the concept of smartphone dependency, in the light of emerging factors, especially in the Indian context. Further, empirical studies on smartphone dependency among Indian youth are few and far between. Thus, it is important for marketers and academicians to identify the core factors influencing smartphone dependency to understand consumer behaviour with respect to smartphones and serve them better. The present study aims to measure students' dependence on smartphones and examines whether social need, social influence, convenience, hedonism and habit of smartphones affect students' dependence on them. Students have been among the age groups primarily targeted by similar studies on communication technologies (Suki, 2013a; Arif & Aslam, 2014; Nayak, 2018).

Research Methodology

Research Objectives

The present study attempts to assess the underlying perceptions of Indian smartphone users; thus, the objectives of the study are:

- To identify the factors affecting dependence of students on smartphones in India.
- To determine the relationship between the factors that affect dependency on smartphone.
- To suggest a refined parsimonious scale for measuring smartphone dependency.

Unit of Analysis

Researchers have discussed that university students are the primary adopters of innovative technology, even when it comes to smartphones (Auter, 2007; Sultan, Rohm & Gao, 2009; Persaud & Azhar, 2012; Kim & Park, 2014). Also, 52 percent of all smartphone owners in 2011 were in the age group of 18-29 years (Arif et al., 2016). The majority of Indian smartphone users lie in the age group of 12-30 years (12-19 years: 17%; 20-30 years: 38%) and those above 30 years are also growing at a steady rate (www.eMarketer. com, 2015). Thus, it was appropriate to consider university students as the unit of analysis for the current study.

Sampling Method

The population of interest for the present study covered students registered in the universities funded by the Central Government of India. The students studying in universities are considered to be heavy Internet users, active on online platforms, interactive and are also behavioural surrogates of non-students (Yoo & Donthu, 2001a; Guth, Schmidt & Sutter, 2007; Abeler, Becker & Falk, 2014). The students in government-funded universities are predominantly from the middle-class section of the Indian society (Heslop, 2014). Shabnam (2012) also stated that the middle class population is supposed to be representative of the population in general. A non-probability sampling technique (convenience sampling) was employed to select the desired sample.

Survey Instrument

The research or survey instrument for the present study has been developed from scales suggested by various researchers in the area (Childers, Carr, Peck & Carson, 2001; Limayem & Hirt, 2003; Ting et al., 2011; Arif et al., 2016; Ahmad et al., 2017). The details of items borrowed from previous studies are provided in Table 2. The responses were collected from smartphone owners on a 5-point Likert scale (1 = Strongly Disagree, and 5 = Strongly Agree) employing the paper-pencil approach.

Table 2: Items Used in Survey Instrument and Their Sources

Construct	Item Code	Statements
Social Needs		
Ting et al. (2011)	SN1	Smartphone allows me to stay connected with those I care about.
Arif et al. (2016)	SN2	I use smartphone to stay connected with friends and family through social networking websites (Twitter, Facebook, Instagram, WhatsApp, etc.).
	SN3	It is easy for me to observe others' happening by using the smartphone.
	SN4	I use my smartphone to catch up with friends and relatives.
	SN5	Smartphone allows me to transfer photo/audio or share data.

Construct	Item Code	Statements
Social Influence		
Ting et al. (2011); Arif et al. (2016)	SI1	The pressure from friends and family is likely to influence the usage rate of smartphone.
	SI2	It is important that my friends like the brand of smartphone I'm using.
	SI3	I would buy a smartphone if it helped me fit in with my social group better.
	SI4	I would be open to be persuaded into using a smartphone if I had low self-esteem.
	SI5	I have seen that smartphone attract people's attention.
Convenience		
Arif et al. (2016); Ting et al. (2011)	C1	Having a smartphone is like having both a mobile phone and a computer together.
	C2	In my work, smartphone saves me time and effort.
	C3	I would prefer carrying my smartphone rather than my laptop.
	C4	A smartphone enables me to receive learning materials anywhere I go.
	C5	Using a smartphone would allow me to accomplish task more quickly.
Hedonism		
Ahmad et al. (2017); Childers et al. (2001)	HD1	Using the smartphone entertains me.
	HD2	Using the smartphone excites me.
	HD3	Using the smartphone is enjoyable.
	HD4	Using the smartphone is interesting.
	HD5	Using the smartphone is fun.
	HD6	Using the smartphone makes me feel good.
Habit		
Limayem et al. (2003)	HB1	The use of smartphone has become a habit for me.
	HB2	I am addicted to using smartphone.
	HB3	The use of smartphone is a must for me.
	HB4	I don't even think twice before using smartphone.
	HB5	Using smartphone has become natural to me.
Dependency		
Ting et al. (2011)	D1	I always use my smartphone to deal with my work.
	D2	I am totally dependent on my smartphone.
	D3	I cannot do anything with my job without the smartphone.
	D4	I will feel insecure when my smartphone is not with me.
	D5	In my daily life, usage of smartphone is high.

DATA COLLECTION

The data were collected using a survey method, through researcher-controlled sampling, from students enrolled in three universities located in and around New Delhi, the capital city of India. These institutions are commonly referred to as 'Central Universities' as they are funded by the Central Government of India and cater primarily to students belonging to the middle class background (Ahmad, Rahman & Khan, 2016; Heslop, 2014). The middle class population is supposed to represent the interests and aspirations of the general population (Ahmad et al., 2016; Shabnam, 2012).

As per the suggestions of the previous researchers (Strange, Forest, Oakley & Ripple Study Team, 2003; Dornyei & Taguchi 2010), the survey instrument (questionnaire) was administered personally by the researchers at various sites around the campus in the university. The physical presence of researchers during administration of questionnaire helped in clarifying doubts (if any) which lead to greater involvement of the respondents and a higher response rate (Strange et al., 2003; Dornyei & Taguchi, 2010). A total of 205 questionnaires were circulated, of which 154 questionnaires were found to be usable. Table 3 provides a brief profile of the respondent's.

Table 3: Respondent's Profile

Characteristic	Frequency
Course	
Graduation	64
Post-graduation	90
Age	
Less than 21 years	60
More than 21 years	94
Gender	
Male	87
Female	67

RESULTS

Refinement of Scale

Initially, a 31-item scale was proposed, which was then refined via the method of repeated iteration where the items having low factor loadings (<0.4) were deleted (Büyüköztürk, Akgün, Özkahveci & Demirel, 2004; Metin, Yilmaz, Coskun & Birisci, 2012; Kline 2014). This resulted in a refined and updated 21-item scale. The item reduction process was done on the basis of Principal Component Analysis (PCA) wherein items having values higher than 0.5 were considered and rest were eliminated (Hair, Black, Babin & Anderson, 1998; Mohammed & Mohd, 2013). The items which cross-loaded on each other were also deleted (Anderson & Gerbing, 1988; Yoo & Donthu, 2001b). Most items showed satisfactory loadings (>0.6) on the proposed factors, leading to a refined 21-item scale. The Cronbach's alpha values (0.593-0.849) for all the factors were found to be within acceptable range and thus the scale was considered reliable (Kerlinger & Lee, 2000; Hair et al., 1998; Mohammed & Mohd, 2013). The results of Confirmatory Factor Analysis (CFA) are presented in Table 4. The KMO value (0.592-0.846) of sampling adequacy was also found to be within the acceptable range (i.e., >0.6), which substantiated that sample size of 154 was satisfactory and sufficient for the purpose of the present study (Hair, Anderson, Tatham & Black, 1995; Herington & Weaven, 2007).

Table 4: Results of Confirmatory Factor Analysis

Statements	Cronbach's Alpha	FAC 1	FAC 2	FAC 3	FAC 4	FAC 5	FAC 6
Social needs	.592						
Smartphone allows me to stay connected with those I care about.		.821					
I use my smartphone to catch up with friends and relatives.		.763					
Smartphone allows me to transfer photo/audio or share data.		.639					
Social Influence	.599						
It is important that my friends like the brand of smartphone I'm using.			.696				
I would buy a smartphone if it helped me fit in with my social group better.			.743				
I would be open to be persuaded into using a smartphone if I had low self-esteem.			.670				
Convenience	.594						
In my work, smartphone saves me time and effort.				.740			
I would prefer carrying my smartphone rather than my laptop.				.657			
Using a smartphone would allow me to accomplish task more quickly.				.814			
Hedonism	.846						
Using the smartphone excites me.					.768		
Using the smartphone is enjoyable.					.822		
Using the smartphone is interesting.					.784		
Using the smartphone is fun.					.827		
Using the smartphone makes me feel good.					.746		
Habit	.736						
The use of smartphone has become a habit for me.						.824	
I am addicted to using smartphone.						.761	

Statements	Cronbach's Alpha	FAC 1	FAC 2	FAC 3	FAC 4	FAC 5	FAC 6
The use of smartphone is a must for me.						.822	
Using smartphone has become natural to me.						.688	
Dependency	.676						
I am totally dependent on my smartphone.							.810
I will feel insecure when my smartphone is not with me.							.779
In my daily life, usage of smartphone is high.							.843

DISCUSSION

The study explores various aspects of smartphone dependency in the light of relevant dimensions identified from available literature. The researchers proposed a smartphone dependency scale taking into consideration classical factors like social needs, social influence and convenience as well as emerging factors like habit and hedonism. As already explained, the initial 31-item scale comprised five independent variables - social needs, social influence, convenience, habit and hedonism and one dependent variable of smartphone dependency. The results of factor analysis revealed that smartphone dependency is indeed affected by the proposed factors. This is probably the first time in Indian context that emerging factors - hedonism and habit - have been found to be relevant in the context of smartphone dependency along with classical factors - social needs, social influence and convenience. Confirmatory Factor Analysis (CFA) resulted in a more parsimonious scale consisting of 21 items. Another significant observation is that both the classical and emerging factors exhibited significant loadings.

Hedonism, the pleasure aspect of smartphone usage, has long been considered to be a contributing factor in the case of mobile phone usage (Wilska, 2003; Mort & Drennan, 2007). Bruner & Kumar (2005) in their study demonstrated that hedonism significantly influences the attitude towards the use of handheld internet devices. The role of hedonism has also been established in studies related to smartphone usage (Chun, Lee & Kim, 2012; Hyun, Park, Lee & Kim, 2014; Chen et al., 2015). The present study too demonstrates that users find smartphone to be exciting, fun, interesting and enjoyable. They also make the users feel good. The findings corroborate those of previous researchers who too reported that use of smartphone was interesting and enjoyable (Chen et al., 2015), had a fun element (Lee et al., 2014; Kwon et al., 2013), was exciting (Kwon et al., 2013) and also made them feel good (Chun et al., 2012).

The present research also revealed that habit also contributes to the formation of smartphone dependency. Habit as a critical factor of smartphone dependency has been discussed in various researches (Oulasvirta, Rattenbury, Ma & Raita, 2012; Ezoe et al., 2016; Aljomaa et al., 2016; Contractor,

Weiss, Tull & Elhai, 2017; Nayak, 2018). In line with the observations of Chen et al. (2015), the respondents in the present study too overwhelmingly agreed that using a smartphone is a habitual activity and comes naturally to them. They also indicated that smartphone is a must for them and they are addicted to it (Shambare, Rugimbana & Zhowa 2012; Van Deursen, Bolle, Hegner & Kommers, 2015). Roberts et al. (2014) had proposed that too much reliance on cellphones among young adults and college students may result in smartphone use becoming more than just a habit. With increasing penetration of smartphones across the globe, the habitual usage has increased manifold and it has become a prominent factor contributing to smartphone dependency (Bian & Leung, 2014).

Smartphone dependency, in the present study, was also found to be influenced by social needs. It has been found to be relevant to smartphone addiction or dependency in various other research works in the domain (Suki, 2013a; Arif & Aslam, 2014; Lin et al., 2015; Harun et al., 2015; Wang Y., 2016; Kim & Shin, 2016; Arif et al., 2016; Aykanat et al., 2016). The respondents believe that smartphone helps them stay connected to their friends and relatives. Similar to the observations by Goldman (2010), the respondents believe that smartphones help them transfer or share data, thus fulfilling their social needs.

This brings us to yet another antecedent of smartphone dependency, i.e. convenience, which is the ease or comfort that a smartphone usage brings with itself. The ability of a smartphone to perform almost all the tasks of a computer, its ability to provide prompt internet access, and its compact size and portability makes it a convenient device to use (Genova, 2010). The respondents stressed that the smartphone helps save time and effort and it makes them accomplish their work more quickly. They also consider smartphone to be a replacement for their laptop. Similar results have been reflected in previous researches as well (Suki, 2013a; Arif & Aslam, 2014; Harun et al., 2015; Arif et al., 2016).

Another factor found to be contributing towards smartphone dependency was social influence, which is the way an individual's beliefs, feelings and behaviour are affected by other people. In the context of smartphone, social influence plays an important role as it influences usage intention as well as usage behaviour (Arif & Aslam, 2014). Interestingly,

respondents in the present study believe that a smartphone helps them overcome feelings of low self-esteem. They also acknowledged that their choice of smartphone is influenced by their friends' whereas it also helped them fit better in their social groups. Several researchers have reported that social influence plays a crucial role in consumer's acceptance of innovative technology like smartphones (Kulviwat, Bruner II & Al-Shuridah, 2009; Ting et al., 2011; Wang, 2016).

Conclusion and Implications

The suggested smartphone dependency scale is a combination of classical factors - social needs, convenience and social influence - and emerging factors - habit and hedonism. Most importantly, the respondents acknowledged that habit and hedonism do contribute to their smartphone usage tendency. The results also depict that the smartphone users do consider the classical factors relevant to their smartphone usage behaviour. This opens up a plethora of opportunities for marketers.

The manufacturers and marketers have to make the smartphone more entertaining and enhance the user's experience of a smartphone. The study clearly brings out that hedonism or pleasure is a critical part of smartphone dependency, which provides abundant options for the marketers to position their offering. Habit has also been found to influence smartphone dependency; thus, positive reinforcement of the brands is a must to create habitual usage, thereby increasing chances of dependency vis-à-vis a particular brand. Marketers should focus more on the social need aspect of smartphone use as it emerged to be having maximum effect on dependency. Social need, i.e., the need to stay in touch with family and social groups, should be viewed by marketers as an opportunity to equip their smartphones with latest social media platforms, multimedia features and sharing options. The marketers should design their smartphones with high capacity memory and fast data connectivity for online applications allowing prompt connectivity between users and their social groups.

Marketers, dovetailing their promotional strategy, may utilise social needs for better positioning of the smartphones and highlight the importance of staying connected through smartphones. The marketers may also utilise the effect of social influences on dependency.

Marketers may project the smartphones to be a necessity within a social community and may position their brand as a status symbol within a social realm. This may be achieved by initiating promotional campaigns via endorsement from effective reference groups. This will enable the social influencers to create a positive impact and provide a superior reinforcement. Similarly, a positive significant relationship between convenience and users' dependence on smartphone provides an opportunity to marketers to position their product

as an easy to use device. In other words, marketers may convince smartphone users that their brand offers a product that is convenient to use. Thus, smartphone manufacturers too need to emphasize on the convenience features by providing larger memory space, more interactive interface, greater data transfer speed, easier connectivity to input/output devices and enhanced facility to read, write and edit files, documents and presentations. There is a need for marketers to provide a holistic experience for the smartphone users vis-à-vis the extracted factors - social needs, convenience, social influence, hedonism and habit - so that the consumer's dependency on smartphones is utilised in a positive manner.

Limitations and Future Research Directions

The present research has certain limitations. Although sampling technique employed was non-probability in nature, due care has been taken to increase the representativeness of the student sample. The small sample size in the study may limit the generalisability of the results. However, future researchers may adopt better innovative approaches in this regard. Response-bias may be present as it is impossible to eliminate it completely.

It is recommended that population sample be further broad-based to improve the generalisability of the results and provide better outcomes. Further, study may be conducted across students from different education levels, instead of university students, to provide a more representative picture of smartphone dependency. A comparative study may be undertaken amongst different cultural groupings to understand how smartphones are perceived across user groups. The suggested 21-item scale may further be refined to better predict dependency on smartphones across different settings. Researchers may utilise the results of present study to further explore the underlying factors of smartphone dependency. Smartphone usage is still in its early stages and more latent motives for using smartphone may emerge, especially in a demographically and culturally diverse country like India. This may open new avenues for researchers to look into and explore the phenomenon.

Acknowledgements

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