

Fear of Missing out, Social Media Engagement, Smartphone Addiction and Distraction: Moderating Role of Self-Help Mobile Apps-based Interventions in the Youth

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Abstract: Smartphones offer high mobility and internet connectivity at the same time which has led to a substantial increase in the number of active social media users on the move, especially the ‘Millennials’. The excessive use of smartphone has been linked with several issues including mental well-being. Recently, different mobile applications have emerged to help users track their excessive use of smartphones and protect them from potential risks to mental health. This paper uses self-determination theory to examine the moderating role of such mobile applications (or self-help interventions) on inter-relationships between social media engagement, smartphone addiction and smartphone distractions. Survey responses from 284 college students reveal that mobile applications could prove to be quite effective self-help interventions that can help the young people in self-regulating their smartphone use. These results have substantial implications for designing effective mobile app-based interventions to save young people from potential risks to their mental health, productivity, and safety in performing their daily tasks. Future research directions have also been pointed out.

1 INTRODUCTION

Social media users have grown exponentially in the past decade. There are now 2.34 billion social media users around the globe (*Number of social media users worldwide 2010-2020 | Statistic*, no date). Compared to the general population students attending colleges these days are the heaviest users of the social media (Alt, 2015). The high rate of smartphone penetration is believed to be one of the dominant driving force behind such increase in active social media users.

The advanced functionalities of the smartphone provide smartphone users with ubiquitous accessibility to the Internet transcending the limits of time and place, therefore enabling them to check social media updates in real time (Kim, Chun and Lee, 2014). The smartphone has become the first thing that people look at when they wake up in the morning and the last thing that they look at before going to sleep (Lee *et al.*, 2014). Smartphones have now become central to people’s everyday lives (Gill,

Kamath and Gill, 2012).

While there are several benefits of smartphones, they do not come without their issues. It has both positive and negative effects in people’s daily routine, habits, social behaviors, emancipative values, family relations and social interactions (Samaha and Hawi, 2016). The excessive use of smartphones has also been linked to lot of negative outcomes like health and well-being (Lee *et al.* 2014; Park and Lee 2012; Samaha and Hawi 2016; Wang *et al.* 2015), student’s academic performances (Duncan *et al.* 2012; Hawi and Samaha 2016; Li *et al.* 2015), distracted driving (Rocco and Sampaio 2016; Terry and Terry 2016) and smartphone addictions (Aljomaa *et al.* 2016; Chiu 2014; Gökçearsan *et al.* 2016; Haug *et al.* 2015). Among all the applications that smartphones provide, the use of social media is found to be a stronger predictor of smartphone addiction (Jeong *et al.*, 2016).

In order to prevent excessive smartphone usage its potential negative outcomes, a variety of mobile applications are available nowadays. These

applications come with features like tracking the time spent on each of the mobile applications, turning off or restricting the (push-up) distracting notifications from certain applications and also restricting smartphone usage by locking or even turning it off after a specified time period. Most of the applications also provide reports and charts on the smartphone usage behavior. Using such applications is referred to as self-help intervention which helps the smartphone users control their excessive smartphone use and therefore protects them from its potential negative effects.

Research so far have identified and examined some negative effects of excessive social media and smartphone use. However, there are no studies, to the best of our knowledge, that examine whether mobile applications-based self-help interventions actually help in preventing excessive smartphone use, smartphone addiction and smartphone distractions. In this context, the objective of this study is to (1) examine the moderating role of self-help mobile applications-based interventions in preventing excessive smartphone use, smartphone addiction and smartphone distraction, and (2) examine the relationship of social media engagement on smartphone with smartphone addiction and smartphone distraction. To investigate these research objectives, a research model has been proposed and tested using the data collected from a large sample of university students from several countries.

2 THEORETICAL BACKGROUND AND HYPOTHESIS DEVELOPMENT

2.1 Basic Psychological Need Satisfaction

Self-determination theory (SDT), a macro-theory of human motivation, development, and wellness (Deci and Ryan, 2008) helps to explain the basic psychological need satisfaction of human beings. According to SDT, effective self-regulation and psychological health of human beings are based on satisfaction of their basic psychological needs for competence, autonomy and relatedness (Przybylski *et al.*, 2013). Competence refers to the individuals desire to feel effective in their interactions with the environment (Roca and Gagné, 2008). Autonomy refers to the individual desire to self-initiate and self-regulate own behavior (Sørrebø *et al.*, 2009).

Relatedness refers to the individual desire to feel connected and supported by others (Sørrebø *et al.*, 2009).

Przybylski *et al.* (2013) suggested that individuals with low basic need satisfaction for competence, autonomy and relatedness have higher levels of Fear of Missing Out (FoMO). On this pretext, the following hypothesis is proposed.

H1: Basic psychological need satisfaction is positively associated with fear of missing out.

2.2 Fear of Missing out (FoMO)

FoMO phenomenon has been defined as a “pervasive apprehension that others might be having rewarding experiences from which one is absent, FoMO is characterized by the desire to stay continually connected with what others are doing” (Przybylski *et al.* 2013, p. 1841).

Research has explored the prevalence of FoMO and its relation to social media (JWT, 2012; Abel, Buff and Burr, 2016). Przybylski *et al.* (2013) is the first study that operationalizes the FoMO construct by collecting a diverse international sample of participants. A recent study by Alt (2015) in academic arena shows that there is a positive link between social media engagement and two motivational factors: Extrinsic and amotivation for learning are more likely to be mediated by FoMO.

FoMO plays an important role in individuals engaging in social media. Yin *et al.* (2015) indicate that FoMO and enjoyment are positively related to continuance intention of using social media. According to Przybylski *et al.*, (2013) individual with high levels of FoMO relate to higher levels of social media engagement.

The use of social media has been associated with greater levels of emotional support from close friends (Putnam 2000 as cited in Alt 2015). People with low basic need satisfaction generally perceive social media as a platform to connect with others in order to develop social competence, and an opportunity to deepen social ties (Przybylski *et al.*, 2013). This context leads to the proposal of the following hypothesis.

H2: Fear of missing out is positively associated with social media engagement.

2.3 Social Media Engagement

Social media refers to the websites and online tools that facilitate interactions between users by providing them opportunities to share information,

opinions, and interests (Khan, Swar and Lee, 2014). Social media engagement simply refers to the extent of an individual immersing into social media activities. People basically engage into social media by sharing personal or social information with close actors in social networks, such as family and friends (Alt, 2015).

Jeong et al. (2016) suggested that people who use smartphones for social media, games, and entertainment were more likely to be addicted to smartphones. The use of social networking mobile applications is a significant predictor of mobile addiction (Salehan and Negahban, 2013). These days, it has been much easier for individuals to engage in social media activities due to ubiquitous accessibility to the Internet through smartphones. This phenomenon leads to the formulation of the following hypothesis.

H3: Social media engagement is positively associated with smartphone addiction.

Social media engagement is also believed to play an important role in smartphone distraction. A user preoccupied with social media activities tends to be distracted from other primary tasks. This phenomenon of distraction can be explained with the concept of multitasking. Research in cognitive science shows that individuals performance decreases while multitasking (Junco, 2012).

Studies in an academic setting have also shown the negative relationship between the use of social media and academic performance. For example, according to Rosen, Mark Carrier and Cheever, (2013) those who use Facebook and text applications while studying had lower GPAs compared with the students who did not. This is clear evidence that excessive engagement in social media is associated with smartphone distraction and it leads to the proposal of the following hypothesis.

H4: Social media engagement is positively associated with smartphone distraction.

2.4 Smartphone Addiction

Smartphone addiction can be defined as the excessive use of smartphones in a way that is difficult to control and its influence extends to other areas of life in a negative way (Park and Lee, 2012).

Smartphones are a significant source of distraction for decision-based activities such as driving, classroom learning, and work-related tasks (Gill, Kamath and Gill, 2012). In academic settings, studies have linked the excessive smartphone use with the poor academic performance of the

smartphone users by distracting them from their primary tasks. Duncan, Hoekstra and Wilcox (2012) have found a significant negative correlation between in-class phone use and final grades of the students. Similarly, Hawi and Samaha (2016) have reported that students who were at a high risk of smartphone addiction were less likely to achieve cumulative GPAs suitable for distinction or higher.

According to Gill, Kamath and Gill, (2012) smartphones are known to be detrimental to cognitive performance and the use of smartphones increases reaction time, reduces focus (attention), and lower performance of task needing mental concentration and decision making. Based on the observation the following hypothesis is proposed.

H5: Smartphone addiction is positively associated with smartphone distraction.

2.5 Self-help Intervention

Installation and use of mobile applications that could help the users in regulating their excessive smartphone use and therefore help in preventing smartphone addictions and smartphone distractions is referred to as self-help intervention in this study. There are a variety of such mobile applications available these days.

The mobile applications come with a variety of features such as blocking the websites one would want to avoid and periodic, customize setting on social media sites to give time-fixed updates (Andreassen, 2015), tracking the time spent on specific mobile applications, turning off or restricting the distracting (push-up) notifications from certain applications, and limiting the overall smartphone usage time by locking or even turning off the smartphone device.

Generally, self-motivated people use such mobile applications and with a belief in their ability and intention to prevent excessive smartphone use. This argument leads to the formulation of the following hypothesis.

H6: Self-help intervention has a moderating effect on the relationship between social media engagement, smartphone addiction and smartphone distraction.

3 RESEARCH MODEL

To examine the relationship between the use of social media through smartphone and its impact on smartphone addiction and distraction, and to

examine the moderating role of self-help intervention, a research model is proposed in Figure 1. The model shows that basic psychological need is a direct antecedent of fear of missing out which affects social media engagement, smartphone addiction, and smartphone distraction. Smartphone distraction is also directly influenced by social media engagement and smartphone addiction.

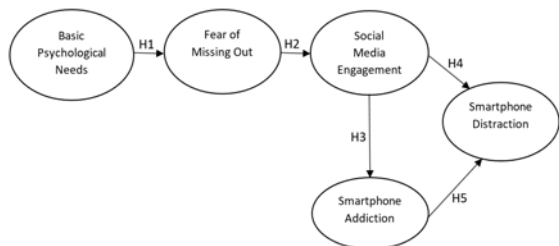


Figure 1: Research Model.

4 RESEARCH METHOD

The proposed research model was tested using the data collected through an online survey. The survey instruments were adapted from the existing measures to this research context. Each of the items was measured on a seven-point Likert-type scale.

The data was collected from university students from several countries. As shown in Table 1 majority of the respondents are 18 to 27 years old. According to Pew Research Center, ages 18 to 29 have always been the most likely users of social media by a considerable margin. Total of 284 useful responses were identified for the analysis in this study. The sample size of 284 should be adequate to test the research model against the required 50 samples for five paths in the research model according to Hair et al. (2011).

The respondents were categorized into two different groups based on whether or not they use self-help mobile applications in their smartphone to monitor and control their smartphone usage behavior. The respondents that use such kind of mobile applications are identified as “Self-help” group and the respondents that do not use such kind of self-help mobile application are categorized as “No-help intervention” group in this study.

Table 1: Sample demographics.

Category		Frequency	Percent (%)
Gender	Male	130	45.77
	Female	154	54.23
Age	<17	0	0
	18 - 22	205	72.18
	23 - 27	72	25.35
	28 - 32	5	1.76
	>33	2	0.70
Nationality	Bangladesh	10	3.52
	China	71	25
	Kazakhstan	25	8.80
	Russia	17	5.98
	South Korea	113	39.79
	Uzbekistan	23	8.10
	Others	25	8.80
Groups	Self-Help Intervention	182	64.08
	No Intervention	102	35.92

5 RESULTS

5.1 Assessment of Measurement Model

This study utilizes structural equation modeling (SEM) supported by partial least squares (PLS) method to examine the research model and its hypotheses. The study in particular uses SmartPLS 3 software package for data analysis (Ringle, Wende and Becker, 2015).

Table 2 shows the assessment results of the measurement model for both the groups. Internal consistency reliability is investigated by using composite reliability. The constructs in the proposed model are above the 0.7 thresholds indicating a high reliability of items used for each construct.

Convergent validity is assessed by evaluating the average variance extracted (AVE) from the measures. The AVE is above the threshold value of 0.5, meeting the criteria of convergent validity.

Discriminant validity is assessed by examining the square root of AVE as recommended by (Fornell and Bookstein, 1982). Table 3 and 4 shows Fornell-Larcker tests of discriminant validity for no-help and self-help group respectively. Table 3 and 4 shows that the square root of AVE of each construct is greater than the correlations between it and all other constructs. Moreover, all the constructs are found to have a stronger correlation with their own measures than to those of others. This shows the proper assessment of discriminant validity.

Table 2: Assessment of the measurement model.

Variables	Average Variance Extracted (AVE)		Composite Reliability	
	No Intervention	Self-Help Intervention	No Intervention	Self-Help Intervention
Basic Psychological Needs	0.65	0.68	0.96	0.96
Fear of Missing Out	0.55	0.55	0.90	0.89
Social Media Engagement	0.61	0.71	0.89	0.92
Smartphone Addiction	0.69	0.69	0.90	0.90
Smartphone Distraction	0.58	0.63	0.88	0.89

Table 3: Fornell-Larcker tests of discriminant validity for no-help group.

	(1)	(2)	(3)	(4)	(5)
(1) Basic Psychological Needs	0.81				
(2) Fear of Missing Out	0.40	0.74			
(3) Social Media Engagement	0.51	0.54	0.78		
(4) Smartphone Addiction	0.14	0.48	0.42	0.83	
(5) Smartphone Distraction	0.34	0.50	0.51	0.66	0.76

Table 4: Fornell-Larcker test of discriminant validity for self-help group.

	(1)	(2)	(3)	(4)	(5)
(1) Basic Psychological Needs	0.83				
(2) Fear of Missing Out	0.52	0.74			
(3) Social Media Engagement	0.56	0.59	0.84		
(4) Smartphone Addiction	0.37	0.52	0.54	0.83	
(5) Smartphone Distraction	0.46	0.48	0.47	0.56	0.79

Note: In Table 3 and table 4 the diagonal elements (in bold) represent the square root of AVE.

5.2 Testing the Model

Table 5 shows the results obtained from the PLS analysis. The coefficient of determination, R^2 , is 0.499 for “No-help group” and 0.355 for “Self-help intervention” group respectively. The results show that the model explains a substantial amount of variance for smartphone distraction in both groups. As shown in Table 5 all the hypotheses are for both the groups are statistically significant.

Table 5: Results of the structural model with path coefficients.

Path	Groups	
	No-help ($R^2=0.499$)	Self-help ($R^2=0.355$)
Basic Psychological Needs - Fear of Missing Out (β_1)	0.4 (4.66)**	0.523 (8.823)**
Fear of Missing Out - Social Media Engagement (β_2)	0.544 (8.237)**	0.594 (11.843)**
Social Media Engagement - Smartphone Addictions (β_3)	0.423 (4.811)**	0.541 (9.057)**
Social Media Engagement - Smartphone Distractions (β_4)	0.278 (3.255)**	0.231 (2.765)*
Smartphone Addictions - Smartphone Distractions (β_5)	0.542 (7.488)**	0.438 (5.178)**

Note: Associated t-statistics are in parentheses and * $p < 0.05$, ** $p < 0.01$

Table 6 summarize the results of the multi-group analysis with their path coefficients. All the relationships (path coefficients) differ significantly across the two groups of smartphone users. These findings make intuitive sense considering that self-motivated people use self-help mobile applications to control their levels of social media engagement, smartphone addictions and smartphone distractions.

Table 6: Results of multi-group analysis with path coefficients.

Paths	Path coefficients differences	P Value
Basic Psychological Needs - Fear of Missing Out (β_1)	0.119	0.873**
Fear of Missing Out - Social Media Engagement (β_2)	0.050	0.726**
Social Media Engagement - Smartphone Addictions (β_3)	0.119	0.873**
Social Media Engagement - Smartphone Distractions (β_4)	0.047	0.346**
Smartphone Addictions - Smartphone Distractions (β_5)	0.104	0.178*

Note: * $p < 0.05$, ** $p < 0.01$

6 DISCUSSION AND CONCLUSION

The primary objective of this study was to examine the moderating role of self-help mobile applications in regulating social media engagement, smartphone addictions and distractions. Additionally, it would examine the relationship between social media engagement on smartphone and smartphone addictions or smartphone distractions. To achieve the objective, this study established a path model and tested six hypotheses.

Table 7: Summary of results.

Paths	Hypotheses	Results
Basic Psychological Needs - Fear of Missing Out	H1	Supported
Fear of Missing Out - Social Media Engagement	H2	Supported
Social Media Engagement - Smartphone Addictions	H3	Supported
Social Media Engagement - Smartphone Distractions	H4	Supported
Smartphone Addictions - Smartphone Distractions	H5	Supported
Moderating role of self-help mobile applications	H6	Supported

The summary of the result is shown in Table 7. Empirical analysis of the research model provides several key findings, which are discussed below. The findings clearly show that self-help mobile applications can actually help in regulating social media engagement, smartphone addictions and distractions. This finding is very crucial as smartphone addictions and distractions have become somewhat a new illness in today’s society. People needing help for their smartphone usage behavior can use self-help mobile applications to protect themselves from the negative effects of the smartphones. In academic settings, educators can recommend students needing help to use such self-help mobile applications.

This study also shows that people with low psychological needs have a high fear of missing out which leads to higher levels of social media engagement. The high levels of social media engagement then lead to smartphone addictions and smartphone distractions. The findings are in line with the emerging recent research (e.g., Przybylski *et al.*, 2013; Alt, 2015). The findings contribute to the existing literature by illustrating the mediating role of social media engagement in explaining smartphone addiction and smartphone distractions.

Nevertheless, there are some limitations of this study and the others that can provide opportunities for future research direction. This study does not take into considerations the types of (and underlying techniques) of mobile applications used as self-help interventions. These days such mobile applications come with a variety of features and capabilities that may have several different types of impact. Future research may take into consideration the types of self-help mobile apps-based interventions and their impact on smartphone use.

This study only deals with the smartphone users that are already using self-help mobile applications. It can be assumed that this group of users are self-motivated and are already less likely to get affected by the negative effects of the smartphones. Future research could ask smartphone users to install such self-help mobile applications and then examine the same effect after some period of time in a regulated environment.

This study has used the data from university students with the majority of respondents ranging from 17 to 27 years old. This group of people are among the heaviest users of social media and smartphones. Therefore, caution is needed while generalizing the results of this study. Different age groups can show different results. Future research is also recommended for other age group and settings.

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