STATE PHUBBING FULLY MEDIATES THE RELATIONSHIP BETWEEN STATE FEAR OF MISSING OUT AND TIME SPENT ON SOCIAL MEDIA

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ABSTRACT

Smartphone users on average spend three hours a day on social media. Research shows that state fear of missing out (state FoMo) is a strong predictor of state pubbing, which is the fleeting reaction in which a smartphone user momentarily engages with their smartphone while he/she is having a face-to-face conversation with another person or persons. Research also shows that smartphone users most frequently used social media apps while phubbing others. However, less is known about the relationships among state FoMo, state phubbing, and Time Spent on Social Media (TSoSM). This study examined the relationships among state FoMo, state phubbing and TSoSM. Multiple regression of data collected from an online survey has revealed that state phubbing predicts TSoSM, when controlling for the effects of all other variables in the model, but more importantly, mediation analysis has revealed that state phubbing fully mediates the effect of state FoMo on TSoSM. Considering the negative effects of state FoMo, state phubbing and TSoSM on social media users, understanding the relationships among these factors paves the way for efforts into helping people change harmful habits.

INTRODUCTION

There are about 3.5 billion social media users worldwide spending on average three hours a day on these platforms [26]. The literature indicates that increased Time Spent on Social Media (TSoSM) is associated with numerous detrimental effects and psychological harms. A recent study has found that longer periods of TSoSM are associated with depression, conduct problems and episodic heavy drinking (Brunborg and Burdzovic Andreas, 2019). Another recent study has found that Adolescents who spend more than three hours a day on social media are at a higher risk of developing mental health problems (Riehm et al., 2019) and while one study (Coyne et al., 2020) has found that TSoSM does not impact mental health, a study by Stronge et al. (2019) has found that TSoSM is weakly related to psychological distress. In addition to these psychological problems, a study by Aalbers et al. (2019) has found that TSoSM is associated with higher levels of interest loss, concentration problems, fatigue, and loneliness. As can be seen, the literature is rich with accounts relating to the psychological impacts of TSoSM. However, there is a paucity of research surrounding the question: what predicts the amount of TSoSM and how the prediction happens? The Uses and Gratifications (U&G) theory has been used in the past to shed light on the motives for using social media. This theory argues that individuals actively seek out media that best fulfills their needs (Hollenbaugh et al., 2020). For example, using the U&G framework, researchers have found that engaging with technology may be motivated by a desire to manage state feelings (Elhai and Contractor, 2018). The Media Displacement theory has been used to explain how TSoSM can take away time that could be otherwise spent with family and friends (Tokunag,a 2016). Using a Media Displacement framework, Hall et al. (2019), for example, found that

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[26] https://au.oberlo.com/blog/social-media-marketing-statistics

online interactions do take away time from face-to-face interactions. Addiction to social media as a research problem has attracted the attention of many scholars and there is no shortage of research in this area. Karadağ et al. (2015), for example, noted that social media is one of the addiction elements within the smartphones. But these research directions don't address the question: what triggers people to spend longer periods of time on social media and how this triggering takes place? The aim of this study is to investigate what predicts TSoSM and under what circumstances this prediction occurs. Given the dearth of research in this area, understanding what predicts the amount of TSoSM and how is a significant contribution to the literature.

RELATED WORK

There are about 3.5 billion smartphone users worldwide[27], a figure that is forecast to continue to grow. More than 90% of the smartphone users access social media from their smartphones.[28] Dependency on the smartphone has created a new problem, namely phubbing. Phubbing is a fleeting reaction in which a smartphone user momentarily engages with their smartphone while he/she is having a face-to-face conversation with another person or persons (Ivanova et al., 2020). Phubbing has been found to be associated with a number of negative impacts (Al-Saggaf and O'Donnell, 2019a). The impacts of phubbing have been researched in a broad range of settings. Phubbing has been found to be common in workplaces (Roberts and David 2017) and when employers engage in phubbing behaviour, phubbing has been found to decrease employee engagement (Roberts and David, 2017). Phubbing is also common among intimate partners (Roberts and David, 2016) and in situations where phubbing occurred over a long period of time, phubbing has been found to weaken the bond between intimate partners (Roberts and David, 2016), and among married partners phubbing has resulted in reduced ratings of relationship satisfaction, which in turn increased levels of depression (Wang et al., 2017). Phubbing has also been found to negatively impact conversation quality. Phubbing during conversation has been found to decrease the perceived quality of communication, and overall relationship satisfaction (Chotpitayasunondh and Douglas, 2016), and checking the smartphone during a face-to-face interaction can reduce the sense of emotional connection (Nakamura, 2015). In addition, frequent texting via smartphones has been associated with increased smartphone-related conflicts and lower evaluations of relationship quality (Roberts and David, 2016).

Phubbing and social media are related. A study by (Al-Saggaf 2020) has found that participants most frequently used social media apps while phubbing others. Al-Saggaf's (2020) participants reported being significantly more likely to phub using utility apps (i.e., web browser), navigation apps, finance apps, social networking apps, and weather apps than lifestyle apps, entertainment apps, travel apps, news apps, and music apps. Within social networking, participants reported being significantly more likely to phub using Facebook, Facebook Messenger, and Apple/Android Messages than Whatsapp, Pinterest, LinkedIn, Skype, WeChat, and Tumblr.

A number of variables have been found to predict state phubbing. A study by van Rooij et al. (2018) has found that state fear of missing out (FoMo) is a strong predictor of state phubbing and that to a less extent state boredom also predicted state phubbing but that the effect of state loneliness on state phubbing was not significant. The associations among state FoMo, state phubbing and social media inspired the need to investigate the relationships among state phubbing, and/or the state phubbing predictors, namely state FoMo, state loneliness and state boredom, and TSoSM.

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[27] https://www.statista.com/statistics/330695/number-of-smartphone-users-worldwide/

[28] https://www.statista.com/statistics/330695/number-of-smartphone-users-worldwide/

FoMo is the need to be in constant contact with one's network, and the fear of missing out on an event where one's network is having fun (Przybylski et al., 2013). FoMo is correlated with social media use (Blackwell et al., 2017; Przybylski et al., 2013), maladaptive smartphone use, and smartphone addiction (Elhai et al., 2016). A study by Elhai et al. (2016) has found that FoMo is the most related factor to problematic smartphone use. However, FoMo was not found to be associated with overall frequency of smartphone use (Elhai et al. 2016). This suggests that even though state FoMo was found to be a strong predictor of state phubbing, it may not predict TSoSM.

Loneliness is the perception of a deficiency within one's network (Bevinn, 2011), triggered either by a small social network size (Al-Saggaf, Utz and Lin, 2016), or unsatisfying relationships as judged by the individuals' personal expectations (Bevinn, 2011). State loneliness is an experience of loneliness that does not persist (Overland, 1991). The relationship between state loneliness and social media is not fully understood, so it is not possible to predict the outcome of the test of the relationship between state loneliness and TSoSM.

State boredom is a fleeting state of under-stimulation in which an individual lacks interest in their surroundings, and is unable to concentrate (Ng et al., 2015). Boredom has been associated with a number of psychological problems especially addiction (Chen & Leung, 2015). Individuals who scored high on boredom played Candy Crush at a much higher level of intensity (Chen & Leung, 2015). But this study focused on leisure boredom; not state boredom. Avoiding feelings of boredom has been found to be a catalyst for using social networking sites (Sheldon, 2008). However, boredom was not found to be associated with smartphone use frequency (Elhai et al., 2018). This suggests that even though state boredom was found to be a weak predictor of state phubbing, it may not predict TSoSM.

METHOD

This study was part of a larger study that looked into the role of personality in smartphone usage. A total of 325 participants completed the Google Forms survey of the study, the link for which was shared in a number of social media sites including sites like Reddit.com. Of the 325 responses received, 19 responses were excluded because the participants indicated ages below 18. As the ethics approval for this study was only for individuals who were 18 and above, the responses of participants under the age of 18 could not be included in the study. Further, as this component of this study is concerned with time spent on social media, the responses of participants who indicated at the time of the study that they did not use any of the social media apps (41 responses) were also excluded from the analysis. In addition, five outliers were detected and unselected bringing the total number of responses used in the analysis to N = 260.

Of the 260 individuals who participated in the study, 23.1% (N=60) of the participants were male and 76.9% (N=200) were female. Participants' ages ranged from 18 to 65, with a mean age of 26.55 (SD = 10.508). Participants came from several countries, including Asian countries, but 40.9% (N=106) of the participants resided in the United States, 25% (N=65) of the participants resided in the United Kingdom and 20.8% (N=54) lived in Australia, with the remaining participants coming from other Asian and Western countries. In terms of the respondents' geographic locations, 47.7% (N = 124) lived in a Metropolitan area and 52.3% (N=136) lived in a Regional area. In terms of social media use, 34.2% (N=89) indicated that they most frequently used Facebook via their smartphone, 36.5% (N=95) said that they used Instagram most frequently, 19.2% (N=50) said that they used Snapchat most frequently and only 10% (N=26) reported that they used Twitter most frequently.

Time spent on social media was measured in minutes per day. Participants were asked: How many minutes, in total, have you spent on social media today? State phubbing was assessed using the state

phubbing scale (Al-Saggaf and O'Donnell, 2019b). The state phubbing scale contained four items rated on a scale from 1 (strongly disagree) to 5 (strongly agree). State boredom was measured using the shortened version of the state boredom scale (Ng et al., 2015). The scale consisted of 19 items rated on a scale from 1 (strongly agree) to 7 (strongly disagree). State fear of missing out was measured using the state fear of missing out scale (Wegmann et al., 2017). The scale consisted of seven items rated on a scale from 1 (not at all true of me) to 5 (extremely true of me). State loneliness was measured using the state loneliness scale (Overland, 1991). The scale consisted of one item ("how often do you feel lonely"), which was responded to on a scale from 1 (Have not yet experienced loneliness) to 6 (Have always felt lonely).

Multiple regression analysis was run in SPSS Version 25 and the mediation analysis was run using Hayes Process Macro for SPSS[29]. The dependent variable was checked for skewness and kurtosis. Excluding the five outliers, mentioned above, improved the conformability of the variable to the assumptions of multiple regression. The variables used to build the model were also assessed for multicollinearity. No problems were found. With regards to the mediation analysis, while all its criteria were met, two of the mediation assumptions, namely normality and linearity were not met. However, given this study is exploratory and because a large sample size and bootstrapping method were used and all the mediation criteria were met –see Figure 2 below, it was judged the effect of not meeting these two assumptions will be small and therefore the mediation analysis continued.

RESULTS

Pearson's correlation was used to assess the relationships between the dependent variable TSoSM and a number of potential predictors; specifically, state phubbing, state FoMo, state boredom, state loneliness, age, gender and geographic location. The correlation analysis has revealed that TSoSM correlated only with state phubbing, state FoMo, age and geographic location. The relationships between TSoSM and state boredom, TSoSM and state loneliness, and TSoSM and gender were not significant and for this reason they were not included in the regression model. For the Pearson's correlations among the variables in the regression model see Table 1 below. The means and standard deviations for these variables are listed in Table 2 below. As can be seen from Table 2, on average participants spent approximately 40 minutes on social media on the day they completed survey. The mean of 2.213 for state FoMo suggests that overall the participants were neither experiencing higher levels of state FoMo, nor lower levels of state FoMo; rather they were almost in the middle. In the case of state phubbing a mean of 3.269 suggests that participants likelihood to engage in state phubbing was at a position between 'neutral' and 'agree'; that is, neither between 'agree' and 'strongly agree' nor between 'disagree' and 'neutral.'

Table 1. Pearson's Correlations among Variables.

	Variable	1	2	3	4	5
1	TSoSM	-	.278**	-.132*	-.181**	.343**
2	State FoMo		-	-0.083	-.220**	.549**
3	Geographic Location			-	.221**	-.144*
4	Age				-	-.278**
5	State phubbing					-

** Correlation is significant at the 0.01 level
Correlation is significant at the 0.05 level

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[29] http://processmacro.org/index.html

Table 2. Means and Standard Deviations of Variables.

Variable	Mean	Std. Deviation	N
TSoSM	40	43.8	260
State FoMo	2.213	0.9	260
Geographic Location	1.52	0.5	260
Age	26.55	10.508	260
State phubbing	3.269	.918	260

The unstandardized regression coefficients are measures of effect size. The multiple regression analysis has revealed that state phubbing is a strong predictor of TSoSM. For a unit change in state phubbing, there are 11.757 units change in TSoSM while controlling for the effects of all other independent variables in the model. Considering TSoSM was measured in minutes per day, each additional unit of change in state phubbing leads to 11.757 minutes of additional time spent on social media. Figure 1 below shows the results of the regression model along with the regression coefficients, their associated standard errors, and their relevant p-values.

Figure 1. Results of the regression model along with the regression coefficients, their associated standard errors, and their relevant p-values.
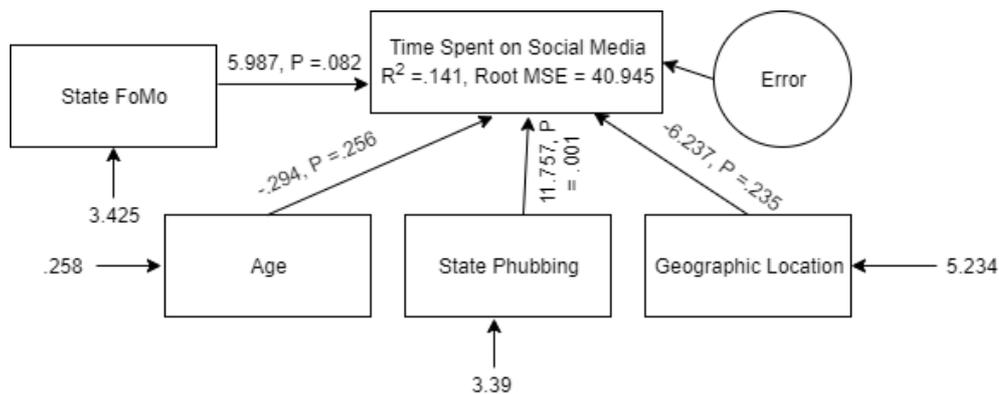
While the effects of state FoMo, geographic location and age were not statistically significant, statistical insignificance of individual predictor variables within a statistically significant regression model does not suggest these individual predictor variables should not be considered when reporting the results. Since the regression model is statistically significant, these individual predictor variables should be counted too. The unstandardized regression coefficient of state FoMo is positive and indicates that an increase of a unit change in state FoMo leads to an increase of almost six minutes of time spent on social media. The unstandardized regression coefficient of geographic location indicates that participants in regional areas spend 6.237 minutes less on social media compared to their metropolitan counterparts. Similarly, the unstandardized regression coefficient of age indicates that as age increases, TSoSM decreases by 30 seconds.
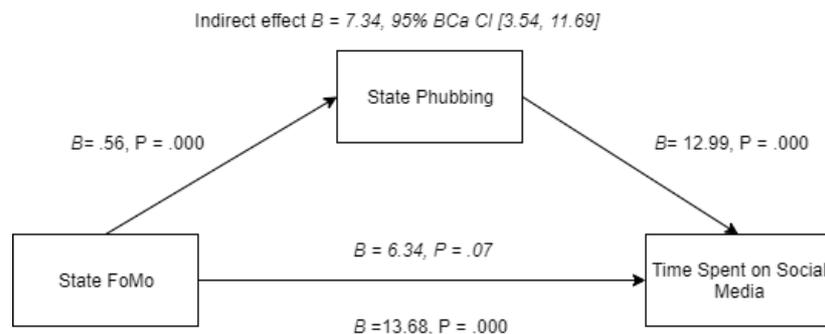
The regression analysis has generated an R^2 of 0.141. The R^2 value of 0.141 shows that the model explained 14.1% of the variation of the dependent variable, TSoSM, around its mean. This is a significant percentage. However, the large value of the Root MSE (SEE) (41.8), indicates that there are issues with the goodness of the fit of the model or more importantly that other variables not included in the model are playing a bigger role in predicting TSoSM. Further research can reveal these variables.

Regression assess the effect of an independent variable on the dependent variable while controlling for the effects of all other independent variables in the model. Mediation address the question how the independent variable predicts the dependent variable. That is, it explains the mechanism of the relationship between the independent variable and the dependent variable. The mediation analysis was conducted using Hayes Process macro for SPSS[30]. Percentile bootsrapped 95% confidence interval were calculated based on 5000 samples.

The Total Effect, measured without including the mediator in the model, shows that state FoMo significantly predicted TSoSM, B = 13.68, t = 4.65, p = .000. The R^2 value of 0.08 shows that the model explains 8% of the variance in TSoSM. State FoMo has a positive relationship with TSoSM, as shown in Figure 2.

The Direct Effect, which includes the mediator variable in the model, was not significant. This is one of the conditions for the occurrence of the mediation and Figure 2 shows this condition is met. This suggests that state FoMo does not directly predict TSoSM when the mediator is included. The indirect effect of state FoMo on TSoSM through state phubbing was significant, B = 7.34, 95% BCa CI [3.54, 11.69]. The R^2 value indicates that the model explains 13% of the variance in TSoSM. Given the direct effect was not significant and the indirect effect was significant, state phubbing fully mediates the relationship between state FoMo and TSoSM, as shown in Figure 2. This means that the entire effect of state FoMo on TSoSM is transmitted through state phubbing.

Figure 2. Results of the mediation analysis.

Indirect effect B = 7.34, 95% BCa CI [3.54, 11.69]

State Phubbing

B= .56, P = .000

B= 12.99, P = .000

State FoMo

B = 6.34, P = .07

Time Spent on Social Media

B =13.68, P = .000

DISCUSSION AND CONCLUSION

The relationship between state FoMo and Time Spent on Social Media (TSoSM) is not fully understood. Previous research has found that state FoMo is a strong predictor of state phubbing (van Rooij et al. 2018) and the current study has confirmed that state phubbing is correlated with TSoSM. The study then examined the relationships among state phubbing, state FoMo and TSoSM. The regression analysis has revealed that state phubbing predicts TSoSM. The regression analysis has shown that each additional unit of change in state phubbing leads to 11.757 minutes of additional time spent on social media. This indicates that the momentary reaction of checking the smartphone during a face-to-face conversation, increases the TSoSM. The fleeting feelings of boredom and loneliness were not correlated with TSoSM. Therefore, these variables were not included in the regression model. The same goes for the demographic variable gender. While state loneliness and gender did not predict state phubbing in Al-Saggaf and O'Donnell's (2019a) study, which is why they were not expected to predict TSoSM, it is not clear why state boredom, which had a weak effect on state phubbing (Al-Saggaf

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[30] http://processmacro.org/index.html

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and O'Donnell 2019b), did not play any role in predicting TSoSM. This is a question for future research, but the result is not unexpected either as boredom was not found to be associated with smartphone use frequency (Elhai et al. 2018). Age had a significant negative effect on TSoSM, suggesting as age increase, TSoSM decreases. This finding is consistent with previous research including Brunborg and Burdzovic Andreas (2019) study. With regards to the demographic variable geographic location, the regression analysis has shown that participants in regional areas spent less time on social media, 6.237 minutes less, compared to their counterparts in metropolitan areas. This finding is interesting and should be looked into in a future study.

The study then tested whether state phubbing mediates the relationship between state FoMo and TSoSM. The mediation analysis has revealed that state FoMo affects TSoSM via state phubbing. State phubbing fully mediated the effect of state FoMo on TSoSM. The result that state FoMo predicts TSoSM through state phubbing may mean that the fleeting feeling of state FoMo become more intense when smartphone users are having face-to-face conversations with others which is why they momentarily check their social media feeds via their smartphones, i.e. phub their conversationalists. This temporary checking of the social media apps during face-to-face conversations to relief the fleeting feeling of FoMo makes state phubbing a coping mechanism. This conclusion can be explained by the U&G theory (Papacharissi and Rubin 2000), which postulates that people may instantly engage with their smartphones to relieve a state feeling, in this case state FoMo. But as users phub others to overcome state FoMo they end up spending more time on social media. These conclusions are all new and given the negative impacts of phubbing and social media they should be the subject of a future study. Indeed, a future study should empirically, preferably experimentally, tests whether the short-lived checking of social media apps during face-to-face conversations (state phubbing) serves as a coping mechanism to overcome the short-lived feeling of FoMo.

This paper makes a significant contribution to the literature. This study is the first that found state phubbing is a strong predictor of TSoSM and is the first that found that the effect of state FoMo on TSoSM is fully transmitted through state phubbing. State FoMo, state phubbing and TSoSM are associated with detrimental effects and psychological harms. Understanding the relationships among state FoMo, state phubbing and TSoSM paves the way for efforts into helping people change harmful habits. The finding that state phubbing is a mediator between state FoMo and time spent on social media which smartphone users momentarily go to when they are having face-to-face conversations with others to overcome state FoMo is a significant discovery that should be examined experimentally in future research.

KEYWORDS: Fear of missing out, phubbing, smartphone, social media, time, regression, mediation.

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