Impact of social media driven mind wandering on cognitive psychology of state university students in Sri Lanka

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Abstract

Individuals started to treat social media as a vital part of their outstanding personality. After introducing the smart phone, social media usage is accelerated. As a negative result of that; unintentionally, people are disconnected even if they are physically available to each other. The social media is continually affecting to the cognitive psychology of the human being. The general objective of this study was to find the impact of social media driven mind wandering on cognitive psychology of state university students in Sri Lanka. An online structured questionnaire was used by selecting 250 undergraduates from state universities in Sri Lanka. Correlation analysis and regression analysis were applied to analyze data by employing SPSS 21.0. The results of the correlation analysis showed significant negative relationship between the independent and dependent variables while regression analysis results confirmed it. The research findings convey that, if students spend more time on social media, it will be a reason for high level of social media driven mind wandering and if the students fail to control it, their working memory functions will be damaged and, high level of social media driven mind wandering will curse damages to the memory retention, reading comprehension and decision making abilities.

Keywords: Cognitive psychology, mind wandering, social media.

1. Introduction

Social media is a technological platform that mainly based on the computers and it facilitates the sharing of ideas, thoughts, and information through the formation of virtual links and communities (Jain, 2018). By design, social media is online based and gives users rapid electronic communication of content. Content may include personal information, documents, videos, and images. Social media comes in many forms including blogs, forums, business networks, photo-sharing platforms, social gaming, microblogs, chat apps, and social networks. Users interact with social media through computers, tablets, or smartphones via web-based software or applications. While social media is pervasive in America and Europe, Asian countries like India, China and Indonesia lead the list of social media usage. The power of social networking is such that the number of social sites users around the world is expected to reach 3.02 billion monthly active social media users by 2021, it is around a third of the population of the world, and an estimated 750 million of these users are expected to be from China itself by 2022 and approximately a third of a billion from India (Statista Research Department, 2017).

At present, most social media users access social media sites via their smartphones or tablets. While this makes it very convenient to keep updated, it also means that social media is widely accessible through the day. Social media platforms are intended to trap users' attention, keep them online, and have they frequently checking their screen for updates. It is how the big social media companies like Facebook or YouTube make money (Alsaif, 2016). But, much like a gambling compulsion or an addiction to nicotine, alcohol, or drugs, social media can create psychological inconsistencies (Kuppuswamy & Narayan, 2010). When people receive a like, a share, or a favorable reaction to a post, it can trigger the release of dopamine in the brain, the same "reward" chemical that follows winning on a slot machine, taking a bite of chocolate, or lighting up a cigarette. The more people are rewarded, the more time they want to spend on social media, even if it becomes unfavorable to other aspects of their lives (Kuppuswamy & Narayan, 2010). Regarding social media, people are already experiencing impairment similar to substance dependencies. With every like, they get a shot of that feel good chemical, dopamine. Therefore, People check likes and they post as many as they can on social sites to feel good. People are anxious if they do not have access. That does not sound like every drug we have ever heard of. However, when that grows, when their social media use goes un-confronted over time, that is when we see the rising levels of social media driven mind wandering (MW) (Graham, 2014). This round-the-clock, hyper connectivity can trigger impulse control problems, the constant alerts and notifications affecting peoples' concentration and focus, disturbing their sleep, and making themselves to their phone or tablet (Parnell, 2017).

The main objective of this study was to find the impact of social media driven MW on cognitive psychology of state university students in Sri Lanka. The quality of the students' cognitive psychology is represented by four factors, namely working memory (WM), memory retention (MR), reading comprehension (RC) and decision making (DM). The finding revealed that high level of social media driven MW of the students will cause damages to their WM, MR, RC and DM abilities. Thus, it can be concluded that

uncontrolled high level of social media driven MW has a negative impact on cognitive psychology. The results of the study will be beneficial to share the knowledge about what is stressing people out every day in social media, what it is doing to cognitive psychology, and how people can craft a better experience for their selves online in social media to avoid the occurrence of social media driven MW.

2. Literature

The term social media address a wide range of internet-based and mobile services that allow users to participate in online exchanges, contribute user-created content or join online communities (Dewing & Canada, 2012). There are several internet services that commonly associated with social media. They are namely as; blogs, wikis, social bookmarking, social network sites, status up-date services, virtual world content, and media sharing sites. Those categories usually overlap to some degree. Social media has gained wider area of the society at large and is also becoming the most important and effective method of communication among people especially among the high school students and undergraduates by filling the gap in existing communication systems. Within the social media sites; Facebook, Twitter and Instagram are now gaining more power over other sites or applications. However, most impotently social media has the potentials of influencing DM in a very short time regardless the distance (Al-Rahmi & Othman, 2013). According to Australian Communications Consumer Action Network ([ACCAN], 2017) Social media websites are not necessarily about meeting new people online. Instead, they are primarily about connecting with friends, family and associates they already have. These websites allow users to share photos, videos and information, organized events, chat, and play online games.

Just like other technology, for example Smartphone, social media is a very effective tool for connecting with people (Jain, 2018). Friends will be able to see their friends profile pages and the information that they share. They will also be able to leave comments or share information with friends' profile page. ACCAN, 2017 reported that the whole point of joining social media is to be in touch with friends and family. Friends in the framework of social media and especially in Facebook, has a specific meaning. For example, a user to interact online with a friend, family member or colleague either one of them must first send a friend request to the other and that request should be accepted. Once the friend request is accepted, the technology recognizes both parties as friends and they are permitted to interact with each other online, so they can view the other person's profile page, see their pictures, and send them messages (Graham, 2014).

MW is an ordinary, everyday occurrence in which attention becomes separated from the current external situation and focused on internal chain of thoughts or on the other hand as a result of MW attention is drowning away by some other task unrelated internal or external factor (Schooler, et al., 2014). Peoples' minds sometimes wander from ongoing activities. Although these experiences can be pleasant and useful, they are often unplanned and swift mistakes (McVay & Kane, 2012). On the other hand, sometimes people must focus attention on what they are doing, yet, despite their efforts to concentrate, their thoughts slip away. Such accidental task-unrelated thoughts (TUTs) may lead to costly performance errors and

even psychological sorrow (Schooler, Baird, Mrazek, Franklin, Phillip, 2013; Schupak & Rosenthal, 2009). These uncontrolled MW can provide theorists of executive functioning with a unique window into aspects of the mind's cognitive-control mechanisms, including how, when, and for whom they tend to fail (McVay & Kane, 2012). Our wading into the stream of thought was motivated by individual differences research on WM capacity. Psychologists are interested in WM capacity because it is a strong, domain-general predictor of important intellectual abilities, such as learning, reasoning, and comprehending (Kane, Conway, Miura, & Colflesh, 2007). Some people are better readers than others, and this variation in comprehension ability is predicted by measures of WM capacity. Reading is fundamental to education and job training and is a part of most people's daily life. Yet individual differences in RC are vast. Comprehension of written material is thus an important ability to explore for cognitive psychologists, in general, and for individual differences researchers, specifically (McVay & Kane, 2012). Reports suggest that people spend more than half of their waking time MW (Killingsworth & Gilbert, 2010). While it is known that MW also affects task performance, there are very few studies that examine MW experimentally, and models of this cognitive process are even scarcer. In fact, most studies consider these distraction processes as some form of mental noise (Marieke, Niels, Jerome, & Mikael, 2015). However, it is likely that MW is not an isolated process but is a collection of different processes.

Social media driven MW is however the experience of thoughts not remaining on a single topic for a long period of time as a result of social media stress, particularly when people are engaged with an attention demanding task (Graham, 2014). When it comes to MW as a result of an addiction to the social media, there are mainly four (4) facts that lead a person toward the task unrelated thoughts (Parnell, 2017). They are, highlight reel, social currency, fear of missing out (FOMO) and online harassment. People are very much interested about the notifications they get through social sites, may be a person simply cannot force, because the notifications are going off the handle and he or she needs to check them and that need, eventually become addiction (Parnell, 2017). Regarding social media people are already experiencing some dependencies. With every like they get, they have that feel good chemical inside their mind (Beck, 2011). They are getting more of that social currency. So what they do to feel good? They check likes, just one more time. They post, just one more time (Graham, 2014). People are anxious if they do not have the access to internet. It does not sound like any drug we can ever hare of. So when that grows when social media usage goes uncomforted over time; that is where we can see the rising anxiety and depression (Szpunar, Moulton, & Schacter 2013). The Canadian association of mental health in 2017, found that it is youngest grades 7-12 students who spend over 2 hours per day on social media reported higher depression, anxiety and suicidal thoughts. When it comes to Sri Lanka, it is estimated that on average they spend about 34 minutes a day on social media (Weerasundera, 2014). Likewise, so many reasons are there to drag peoples' attention to other task unrelated thoughts. Among those many reasons, social media has now become number one (Jain, 2018).

MW often leads to performance and accuracy errors during activities that are demanding and require concentration (Malone, 2009). Students are often asked to concentrate on demanding tasks in their studies, and by the nature of this principle, off-task thinking would inherently be prohibitive to their success (Hollis & Christopher, 2016). Further, the distracting nature of social media and technology may greatly increase the likelihood of MW when students are engaged in online learning (Hollis & Christopher, 2016). MW is a shift from an ongoing activity to task unrelated thoughts. These drifting thoughts are quite common; normally MW 30 percent – 50 percent of the time on our daily lives (Levinson, Smallwood, & Davidson, 2012; McVay & Kane, 2012). And this common MW experience can result in deficits. When tasks require concentration or are cognitively demanding, wandering to task unrelated thoughts (TUTs) often leads to performance and accuracy errors on the primary activity (McVay & Kane, 2012; Unsworth & McMillan, 2013).

The term "cognition" refers to all processes by which the sensory input is transformed, reduced, elaborated, stored, recovered, and used. It is concerned with these processes even when they operate in the absence of relevant stimulation, as in images and hallucinations (Zhu, Zhang, & Jiang, 2014). Cognition is involved in everything a human being might possibly do; that every psychological phenomenon is a cognitive phenomenon. But although cognitive psychology is concerned with all human activity rather than some fraction of it, the concern is from a particular point of view (Neisser, 1967). Cognitive psychology engages with the study of interior mental processes which all of the stuffs that running on inside the human brain, including perception, judgment, memory, attention, language, DM, and learning (Cherry, 2018). The years 1956 and 1957 were important points in the development of cognitive psychology as several important papers/theories emerged, including: Chomsky's theory of language, Miller's concept of seven plus or minus two chunks in short term memory, Newell and Simon's general problem solving model, Bruner et al.'s ideas on concept formation and Artificial intelligence (Brown, 2007).

When it comes to cognitive psychology of a student, it can be measured by using four dimensions – WM, MR, RC and DM (Braisby & Gellatly, 2005). MR, reading and DM are the most essential cognitive psychologies that required for better education settings (Braisby & Gellatly, 2005). A good student whose academic performances are high, associated with a high level of memory, retention, RC and a good DM abilities. MW often leads to performance and accuracy errors during activities that are demanding and require concentration (Malone, 2009). Students are often asked to concentrate on demanding tasks in their studies, and by the nature of this principle, off-task thinking would inherently be prohibitive to their success (Hollis & Christopher, 2016).

3. Methodology

3.1. Conceptual framework

The conceptual framework (Figure 1) of the study was formulated based on well-established literature specially the studies done by Braisby and Gellatly (2005), Parnell (2017), Ellis (2015), Goel and Hultén (2018) and Graham (2014) examined the impact of the social

media driven MW on WM, MR, RC and DM which determine the quality of the cognitive psychology.
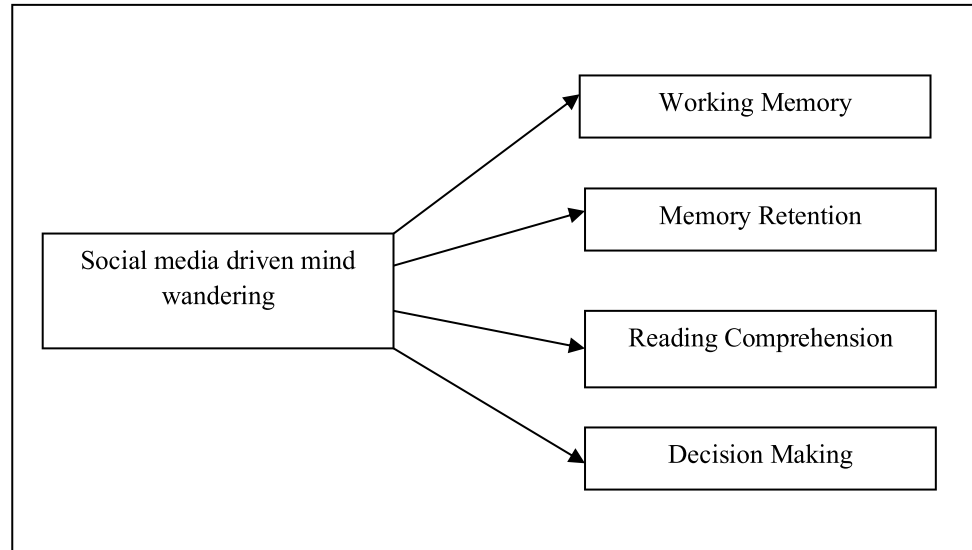

Figure 1 Conceptual framework of the study
Source: Developed by researchers.

To measure the WM and the MR, the researchers used duration, capacity, and encoding and order effect as dimensions. Similarly, phonemic awareness, understandability, fluency and vocabulary considered as the dimensions of RC (Ellis, 2015) and motivation, thinking and analyzing, adapting and changing and bias and preference were taken as the dimensions of the DM factor (Goel & Hultén, 2018).

3.2. Population and sample

The population of this study was all the students who were studying in state universities of Sri Lanka. By 2019, there were 15 universities governed under the University Grant Commission (UGC). They were University of Colombo, University of Peradeniya, University of Sri Jayewardenepura, University of Kelaniya, University of Moratuwa, University of Jaffna, University of Ruhuna, The Open University of Sri Lanka, Eastern University-Sri Lanka, South Eastern University of Sri Lanka, Rajarata University of Sri Lanka, Sabaragamuwa University of Sri Lanka, Wayamba University of Sri Lanka, Uva Wellassa University and University of the Visual & Performing Arts. According to the details obtained from Sri Lanka University statistics reprt published in 2019 by the UGC of Sri Lanka, 112,999 undergraduates were studying in the above-mentioned state universities by the end of 2018. The sample size was determined as 250 students from the aforementioned 15 Universities. The sample size is calculated by using the following formula (Formula 1).

$$Samplesize = \frac{\frac{z^2 \times p(1-p)}{e^2}}{1+(\frac{z^2 \times p(1-p)}{e^2 N})}$$
Formula 1 Sample Size calculation

Where,
N = population size,
e = Margin of error (percentage in decimal form),
z = z-score

The margin of error was considered as 6.2 percent and the z-score value was taken relent to 95 percent of confidence level. That is 1.96. To select the sample, the random sampling method was employed. A self-administrated online questionnaire was distributed using electronic communication channels to collect data from the selected sample. The questionnaire was included the questions items to obtain information about the respondents' demographic factors and measure their level of MW and cognitive psychological state. The preliminary questions were directed to obtain demographic details and Likert scale questions with five levels, ranging from strongly disagree (1) to strongly agree (5) were used to measure the students' MW level and cognitive psychological state. 127 from the total 250 respondents were female and it is 51% from the total. Remain 123 were male and that is 49% from the total respondents.

3.3. Validity and reliability

A reliability test is used to examine the internal consistency of the constructs that were used to measure key independent and dependent variables of the statistics while validity states that tests having the same or similar constructs should be highly correlated. Table 1 shows the summary of reliability and validity statistics for the independent variable (Social media driven MW) and the dependent variables (WM, MR, RC, and DM).

Table 1
Test of validity and reliability

| Variables | Convergence Validity | | | Reliability |
	KMO Statistics	Bartlett's test stat. (P value)	AVE to be > 0.5	Alpha
Social Media Driven MW	0.826	588.087 (<0.001)	0.60888	0.861
WM	0.783	352.813 (<0.001)	0.64915	0.819
MR	0.774	236.200 (<0.001)	0.58648	0.761
RC	0.793	311.108 (<0.001)	0.63447	0.807
DM	0.737	183.883 (<0.001)	0.54251	0.716

Source: Survey Data.

According to Table 1, the Cronbach's alpha values of all variables were ranged from 0.716 to 0.861, which fulfills the relevant accepted level of reliability. The KMO statics represented that this sample is adequate. In fact, all the cases of this value are higher than 0.5 and it concluded that the sample adequacy of each variable. Bartlett's test value examined P value of the survey data to measure the validity of sample. Same as in KMO here in all the cases it ensures the validity of sample. Eventually to measure the validity of questionnaire AVE has been used and this value should be more than 0.50 and it also ensure the validity.

4. Result and discussion

Based on the descriptive analysis results, it appears that the respondents are experiencing a relatively high social media driven MW (M = 3.16, SD = 0.63). But, when considering the skewness, it is -0.006, which means it's negatively skewed. The WM of the respondents is relatively low with a mean of 2.96 and a standard deviation of 0.82. It is positively skewed (0.590). Respondent's MR is also relatively low (M = 2.80, SD = 0.84). When considering the skewness, it is 0.60. That means it is positively skewed. Respondents' RC is generally low (M = 2.93, SD = 0.83) and it is also positively skewed (0.36). Respondent's DM is also relatively low with a mean of 2.82 and a standard deviation of 0.68 and it is positively skewed (0.58). The mean values of the variables are range from 2.79 to 3.16 and the standard deviation values are range from 0.63 to 0.84. The highest mean value is 3.16 and the lowest men value is 2.80.

Table 2
Results of descriptive statistics

	Mean	Std. Deviation	Skewness (Std. Error)
Social media driven MW	3.155	0.630	-0.006 (0.154)
WM	2.960	0.817	0.590 (0.154)
MR	2.797	0.839	0.596 (0.154)
RC	2.928	0.830	0.360 (0.154)
DM	2.821	0.681	0.579 (0.154)

Source: Survey Data.

Table 3

Results of correlation matrix analysis

		MW	WM	MR	RC	DM
MW	Pearson correlation	1.000				
	Sig. (1-tailed)					
WM	Pearson correlation	-0.680**	1.000			
	Sig. (1-tailed)	0.000				
MR	Pearson correlation	-0.621**	0.647**	1.000		
	Sig. (1-tailed)	0.000	0.000			
RC	Pearson correlation	-0.660**	0.738**	0.650**	1.000	
	Sig. (1-tailed)	0.000	0.000	0.000		
DM	Pearson correlation	-0.650**	0.682**	0.612**	0.673**	1.000
	Sig. (1-tailed)	0.000	0.000	0.000	0.000	

*Note: N = 250, **. Correlation is significant at the 0.01 level (1-tailed).*
Source: Survey Data.

According to Table 3, the Pearson correlation value for social media driven MW and WM is -0.680 and it implies that there is a negative relationship between the above variables. Moreover, the significant value is 0.000 (P<0.05) hence both variables are significant at 0.05 level. Therefore, it can be statistically said that there is a significant and negative relationship between Social media driven MW and the WM of the state university students in Sri Lanka. The Pearson correlation value for social media driven MW and MR is -0.621 and it is also a negative relationship between the above variables. According to that table, the significant value is 0.000 (P<0.05) hence both variables are significant at 0.05 level. Therefore, it can be statistically said that there is a significant and negative relationship between social media driven MW and MR of the state University students in Sri Lanka. Table 3 shows that the Pearson correlation value for social media driven MW and RC is -0.660 and it was the negative relationship between the above variables. Its significant value is 0.000 (P<0.05) hence both variables are significant at 0.05 level. Therefore, it can be statistically elaborated that there is a significant and negative relationship between social media driven MW and RC of the state university students in Sri Lanka.

Regression analysis (see Table 4) is used to explain the contribution of the independent variable in the manipulation of the dependent variables as well as regression analysis is used to indicate the overall fit of the model. The researchers applied simple regression analysis to test the hypothesis and R2 to measure the overall fit of the model and the following tables show the results for each of the four variables.

Table 4
Result of regression analysis

Path	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
MW→WM	0.680	0.463	0.461	0.600	1.855
MW→MR	0.621	0.386	0.384	0.659	1.783
MW→RC	0.660	0.436	0.434	0.625	2.003
MW→DM	0.650	0.422	0.420	0.519	2.146

Source: Survey Data.

In table 4, the R2 value indicates how much of the total variation in the dependent variable can be explained by the independent variable. According to the obtained results, the R2 values for the WM, MR, RC and DM are 0.46, 0.39, 0.44, and 0.42 respectively and they imply that the 46 percent of the WM of the respondents is affected by social media driven MW and the rest 54 percent of students WM is decided by other factors which are explicit to the study. Similarly, 39 percent of the MR, 44 percent of the reading comprehension, and 42 percent of the DM of the respondents are affected by social media driven MW.

5. Conclusion and recommendation

The general objective of this study was to find the impact of social media driven MW on cognitive psychology of state university students in Sri Lanka. By considering the research findings; the researchers can convey that, if students spend more time on social media, it will be a reason for a high level of social media driven MW and if the students fail to control it, their WM functions will be damaged and high level of social media driven MW will also curse damages to the MR, RC and DM abilities of the undergraduates. While highlight reel, social currency, FOMO, online harassments and addiction were identified as the main courses of social media driven MW, the ultimate conclusion was that uncontrolled high level social media driven MW harms the cognitive psychology of state university students in Sri Lanka.

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