Social Media Overload and Fatigue: The Moderating Role of Multitasking Computer Self-Efficacy

Completed Research

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Abstract

This paper investigates the moderating role of multitasking computer self-efficacy on the relationship between social media overload and social media fatigue. We conceptualize social media overload using two dimensions (i.e. information overload and communication overload) and hypothesize that these two dimensions affect social media fatigue. In addition, we also hypothesize that multitasking computer self-efficacy will attenuate the effects of these two dimensions on social media fatigue. We test the model by collecting data from 131 students from an Irish university. Partial Least Squares techniques were used to test the model. The findings suggest that both information overload and communication overload significantly affect social media fatigue, although, the effect of communication overload is more critical than that of information overload. Furthermore, our study results suggest that multitasking computer self-efficacy attenuates the effect of information overload, and reinforces the effect of communication overload on social media fatigue.

Keywords

Social networking sites, Information overload, Communications overload, Social media fatigue, Multitasking computer self-efficacy.

Introduction

The unintended consequences of social media have been widely recognized in the recent literature (Mäntymäki & Islam 2016; Islam & Mäntymäki in press). One such unintended consequence is social media fatigue, which refers to the subjective and self-evaluated feeling of tiredness from social media use (Lee et al. 2016). The extensive adoption and use of social media has exposed people to a massive amount of information and communication demands that may require energy and cognitive processing beyond their capabilities, a phenomenon called social media overload (Lee et al. 2016; Zhang et al. 2016), which can lead to physical and psychological strain (Lee et al. 2016).

Although, the unintended consequences of social media have been widely discussed in the recent literature, there is a lack of research that investigates fatigue (see Lee et al. 2016). In particular, research that investigate coping with social media fatigue has been rare. Social media fatigue may deteriorate mental and psychological strength as well as lead to withdrawal from the service (Dhir et al. 2018). Thus, understanding and mitigating fatigue will help promote sustained social media usage – a pivotal issue for any service provider and a focal theme of the post-adoption stream of IS research (Bhattachjee 2001; Maier et al. 2015a; Islam et al. 2017).

Furthermore, social media provide an opportunity for multitasking, i.e. performing two or more tasks at the same time (Brooks 2015). Prior research suggests that multitasking is a positive thing and may increase productivity for simple tasks (Speier et al. 2003). However, it may also be a negative thing and can have a detrimental effect on productivity, as higher multitaskers are more susceptible to irrelevant interference (Brooks 2015). At the same time it is also true that not all users have the same multitasking capability. Some computer users truly believe that they are efficient in multitasking and capable of
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completing a number of tasks concurrently in an efficient manner. Such users might have better capabilities to cope with social media overload and fatigue. Consequently, we investigate how multitasking computer self-efficacy, a belief that a computer user can perform multiple tasks concurrently on the same computing device, reduces or reinforces social media fatigue created from social media overload.

Adopting the work of Karr-Wisniewski & Lu’s (2010) on technology overload, we conceptualize social media overload using two dimensions: information overload and communication overload. Information overload occurs when the information that needs to be processed exceeds one’s information processing capabilities. On the other hand, communication overload occurs when one is interrupted by too many communication demands that exceed his/her communication capacities.

We collected data from 131 students from a university in Ireland and analysed the data using the partial least squares (PLS) approach. The key findings are: (1) both information overload and communication overload affect social media fatigue, (2) communication overload plays more critical role in predicting social media fatigue than information overload, and (3) multitasking computer self-efficacy attenuates the effect of information overload, but reinforces the effect of communication overload on social media fatigue.

Theoretical Foundation

Social Media Fatigue

Fatigue is a complex concept and has been defined in many ways. Piper et al. (1987, p. 19) defined fatigue as “a subjective, unpleasant feeling of tiredness that has multiple dimensions varying in duration, unpleasantness and intensity”. Hart et al. (1990) defined it as a subjective feeling of discomfort, decreased motivation, and increased physical lassitude. Lewis et al. (1992) defined it as a lassitude or exhaustion of mental and physical strength resulting from bodily labour or mental exertion.

Social media users are spending increasing amounts of time with the platforms; one third of online time is spent on social media. It follows that many users may feel fatigue symptoms. Social media fatigue is a new phenomenon that is attracting attention in research (Lee et al. 2016; Zhang et al. 2016). Social media fatigue can come from variety of sources as described by Bright et al. (2015). First, it can come from interpersonal interactions. For example, social network service users can send friend requests, post about social games, show what they ate for breakfast, and share photos. Second, interaction with companies and brands can also create fatigue. For example, brands continue to promote products on social media and get opinions about their products and services. Third, changes in the interface or introduction of new features may create fatigue to the users.

Social media users back away from their use when they become overwhelmed with too many sites, too many pieces of content, too many friends and contacts, and too much time spent keeping up with these connections (Bright et al. 2015). Users can face difficulties in managing the massive amount of information and communication from others and feel fatigued (Lee et al. 2016). In turn, fatigue may lead to dissatisfaction (Zhang et al. 2016) and discontinued use of social media (Ravindran et al. 2014; Zhang et al. 2016).

Fatigue is an individual’s feeling based on subjective experiences. Consequently, we define social media fatigue as a subjective and self-evaluated feeling of tiredness from social media usage (Lee et al. 2016). Several prior studies investigated the antecedents of social media fatigue. For example, Lee et al. (2016) found that information overload, communication overload, and system feature overload affect social media fatigue. Zhang et al. (2016) echoed the same findings. Bright et al. (2015) reported social media confidence, social media self-efficacy, privacy concern, and social media helpfulness as the determinants of social media fatigue. Maier et al. (2015a) identified several technology related stressors that may influence social media exhaustion. However, there is yet to be a study published, which examines how users’ multitasking abilities influence social media fatigue. Social media, especially social networking, has been identified as a multitasking-heavy technology (Bannister & Remenyi, 2009).

Information and Communication Overload

Our inability to cope with the slew of digital communications is crippling economic growth. Nearly 30% of a worker’s day in the US is spent on either interruptions or recovery time from social media interruptions,
equating to $650 billion annual loss in productivity (Kent, 2012). Studies from a variety of disciplines have also linked communication and information overload to stress (Tarafdar et al. 2007), low morale (Ayyagari et al. 2011), poor decision-making (Pennington & Tuttle 2007), mental health problems (Chen & Lee 2013), and decreased performance (Karr-Wisniewski & Lu 2010).

While communication overload and information overload are often used interchangeably, they are in reality quite distinct concepts. Communication overload is a relatively new phenomenon emerging in parallel with the appearance of social media in the past decade. In contrast, the earliest examples of information overload can be traced back to the library of Alexandria where archaeological evidence shows that there was more information in one place than one human being could assimilate over a lifetime. Communication overload is the undesirable condition arising when communication demands from ICT channels, such as social media, exceed users' processing capacities (Cho et al. 2011).

Social media use can have positive outcomes such as increased social capital (Ellison et al. 2007) and psychological wellbeing (Islam & Patil 2015). However, according to Karr-Wisniewski & Lu (2010), technology use, once exceeding the optimum level, can result negative outcomes. Islam & Patil (2015) also show that social network service use has an inverted U shaped relationship with psychological wellbeing. Perhaps the phenomenon of “technology overload” can explain the dilemma that more technology does not always result to higher social capital (Ellison et al. 2007) and productivity (Karr-Wisniewski & Lu 2010). Karr-Wisniewski & Lu (2010) describe three dimensions of technology overload: information overload, communication overload, and system feature overload. Information overload occurs when the information that needs to be processed exceeds one’s information processing capabilities. Communication overload occurs when one is interpreted by too many communication demands that exceed his/her communication capacities. Finally, system feature overload occurs when the given technology is too complex for a given task or the addition of new features is outweighed by the impact of technical resources and the complexity of use. Maier et al. (2015a) describe social overload as another kind of social media overload and defined it as the negative perception of SNS usage when users receive too many social support requests and feel they are giving too much social support to other individuals embedded in their virtual social network.

Among these dimensions, we suggest information overload and communication overload are more typical in social media context. We believe system feature overload may have little importance in the social media use context. It is because, established social media service providers like Facebook have been widely adopted among a variety of users due to the ease of use of these services. The social media operators continuously aim at improving the user experience by developing more user-friendly interfaces (Islam et al. 2017). Thus, the users are unlikely to suffer from system feature overload in the social media context. We also argue that social overload can be already captured using communication overload as the social support requests may come as communication requests. Based on the above, we adopt information overload and communication overload in order to conceptualize social media overload in this paper.

**Multitasking Computer Self-Efficacy**

The concept of multitasking computer self-efficacy has emerged from the concepts of multitasking and self-efficacy. Multitasking refers to performing two or more tasks at the same time (Stephens & Davis 2009). Multitasking is a common practice in the IT-infused workplace. Turner and Reinsch (2007) feel that “multitasking has become synonymous with the communication technology–infused workplace of today” (p. 36). Multitasking may bring both positive and negative results as suggested by prior literature. For example, Speier et al. (2003) suggest multitasking may improve one’s productivity in simple tasks. However, Jacobsen & Forste (2011) found that multitasking via electronic media had a negative relationship with GPA among college students.

Self-efficacy (Bandura 1986) refers to the belief of one’s capability to perform certain behaviour. Compeau & Higgins (1995) adapted it to the context of computing and defined computer self-efficacy (CSE) as one’s belief about his/her capability to use computing devices. CSE has been widely used in IS literature, where it has been regarded as a motivator for IT adoption and use (e.g., Agarwal et al. 2000; Fagan et al. 2004). CSE is significantly related with problematic Internet use (Ceyhan & Ceyhan 2008), as it is likely that users who believe that they have higher capability for computer usage will be drawn in deeper into the possibilities that the Internet provides. For these users, believing in their abilities in using computing
devices should reduce the amount of overload, as they would not be overwhelmed by the tasks that they are performing.

Combining these two concepts, multitasking computer self-efficacy is defined as a person’s perception of the ability to perform and ease of computer use regarding concurrent execution of two or more tasks by using a single central processing unit (Basoglu et al. 2009). In short, multitasking computer self-efficacy is the belief that a computer user can perform multiple tasks concurrently efficiently on the same computing device. In prior research, higher level of multitasking self-efficacy has been found to help reduce cognitive load in an environment with interruptions (Basoglu et al. 2009).

**Hypotheses Development**

**Direct Effects of Overload on Social Media Fatigue**

Information overload occurs when the amount of input to a system exceeds its processing capacity (Milord & Perry 1977). Social media provide the opportunity to access a massive amount of information that can cause information overload. Too much information on social media can quickly cross users’ cognitive limits in processing information and make them feel overwhelmed (Karr-Wisniewski & Lu 2000), leading to information overload. Information overload can lead to dysfunctional consequences such as information anxiety (Wurman 1989), information fatigue (Lewis 1996), stress (Misra & Stokols 2011), and distract users from other important activities (Eppler & Mengis 2004). In the social media context, several prior studies reported information overload as one of the major antecedents of social media fatigue (e.g. Bright et al. 2015; Lee et al. 2016; Zhang et al. 2016). Consequently, we propose the following hypothesis.

**H1. Information overload will have a positive influence on social media fatigue**

Social media services also offer the opportunity to network with many people. Thus, social media users may have to deal with too much communication from their networks at the same time. These interruptions may distract them from their primary tasks, and also may cause the user to become overwhelmed, as they can’t deal with the situation effectively. Interruptions can exacerbate information overload in two ways. First, they take time away from working on on-going work activity, potentially resulting in a feeling of time pressure and, ultimately, information overload (Speier et al. 1999). Second, the interruptions themselves can place greater demands on cognitive processing and result in an increase in information load and task processing demands (Norman & Bobrow 1975). Too many interruptions can have negative consequences such as decreased work productivity (Mcfarlane & Latorella 2002) and increased fatigue (Klapp 1986). In the social network service use context, Lee et al. (2016) reported communication overload as a major source of social network fatigue. Consequently, we hypothesize the following.

**H2. Communication overload will have a positive influence on social media fatigue**

**Moderating Role of Multitasking Computer Self-Efficacy**

Louis and Sutton (1991) describe that when one encounters a new task he/she tries to apply his/her existing schemas in order to make sense of the new task. A schema is described as “an abridged, generalized, corrigible, organization of experience that serves as an initial frame of reference for action and perception” (Weick 1979, p. 50). We argue that people with higher multitasking computer self-efficacy possess better schemas and knowledge that can be used for problem solving using a computer. These people are better able to construct the schema required for a new task, compared to the people with lower multitasking computer self-efficacy. In other words, a person’s ability to use a computer for multitasking determines the extent of cognitive processing they must employ to successfully execute a task. Those with lesser ability must use more cognitive resources not only for learning a computer but also to process the requirements of the task. Furthermore, humans use thinking and sense making for problem solving (Bandodkar & Singh 2014). Human thinking and sense making is a user's constructive activity of finding meaning in information in order to extend his or her state of knowledge on a particular problem (Dervin 1983). Thus, sense making is an information-seeking endeavour in which a person is forming a personal point of view by actively finding meaning in information, which fits in with what he or she already knows (Bandodkar & Singh 2014). People with higher multitasking computer self-efficacy are expected to be more efficient in recognizing information that fits with the problem in hand.
Based on the above discussion, we suggest that people with higher multitasking computer self-efficacy will experience lesser fatigue from information and communication overload compared to those with lower multitasking computer self-efficacy. Consequently, we hypothesize the following.

**H3. Multitasking computer self-efficacy will negatively moderate the relationship between information overload and social media fatigue**

**H4. Multitasking computer self-efficacy will negatively moderate the relationship between communication overload and social media fatigue**

The overall research model is shown in Figure 1.

**Figure 1. The Research Model**

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**Study Design**

**Data Collection and Analysis**

To evaluate our research model, we developed a measurement instrument and then conducted a survey. The measures for information overload, communication overload, social media fatigue, and multitasking self-efficacy were adopted from prior literature and were measured on a seven-point Likert scale with response choices ranging from “Strongly disagree (1)” to “Strongly agree (7)”. The sources of the measures are presented in Table 1. Data was collected from the students of an Irish university. Invitations to participate in the research were sent to 400 individuals randomly selected from the university’s database. The pool of invited respondents consisted of bachelor’s, master’s and PhD students as well as graduates who have enrolled to study part-time or to take additional courses. A total of 131 usable responses were received. This yielded a response rate of 33%. Approximately 52% of the respondents were male.

The analysis utilized the PLS approach with SmartPLS software (Ringle et al. 2005). We followed Gefen & Straub’s (2005) procedure to test convergent and discriminant validity. Convergent validity indicates the extent to which items on a scale, which are theoretically related, are also related in reality. We evaluated the convergent validity by examining item loadings, composite reliabilities, and average variance extracted (AVE) values. With regard to item loadings, Fornell & Larcker (1981) have recommended values of at least 0.7 to be acceptable. Based on this criterion, one item (Comm_Overload3) from communication overload was removed. The composite reliabilities being above 0.8 and AVE values exceeding 0.5 further support satisfactory convergent validity (Fornell and Larcker 1981). The loadings, CRs and AVEs are shown in Table 1.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Item</th>
<th>CR</th>
<th>AVE</th>
<th>Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Overload (Karr-Wisniewski &amp; Lu 2010)</td>
<td>Info_Overload1: I am often distracted by the excessive amount of information in social media</td>
<td>0.87</td>
<td>0.68</td>
<td>0.77</td>
</tr>
<tr>
<td></td>
<td>Info_Overload2: I find that I am overwhelmed by the amount of information that I process on a daily basis from social media</td>
<td></td>
<td></td>
<td>0.88</td>
</tr>
<tr>
<td></td>
<td>Info_Overload3: Usually, my problem is with too much</td>
<td></td>
<td></td>
<td>0.83</td>
</tr>
</tbody>
</table>
information to make sense of, instead of not having enough information to make decisions

Multitasking Computer Self-Efficacy (Brooks 2015)

- MCSE1: I believe I have the ability to work effectively on more than one task on a computer at once
- MCSE2: I believe I have the ability to shift from task to task effectively on a computer
- MCSE3: I believe I have the ability to do several things at once on a computer

Social Media Fatigue (Lee et al. 2016)

- Fatigue1: I find it difficult to relax after continually using social media
- Fatigue2: After a session of using social media, I feel really fatigued
- Fatigue3: Due to using social media, I feel rather exhausted
- Fatigue4: After using social media, it takes effort to concentrate in my spare time
- Fatigue5: During social media use, I often feel too fatigued to perform other tasks well

Communication Overload (Karr-Wisniewski & Lu 2010)

- Comm_Overload1: I feel that in a less connected environment, my attention would be less divided allowing me to be more productive
- Comm_Overload2: I often find myself overwhelmed because technology has allowed too many other people to have access to my time
- *Comm_Overload3: I waste a lot of my time responding to messages that are not directly related to what I need to get done
- Comm_Overload4: The availability of electronic communication has created more of an interruption than it has improved communications

Note: Average Variance Extracted (AVE), Composite Reliability (CR), * Items were removed due to loadings less than 0.70

Table 1. Item means, standard deviations (S.D.), loadings and significance levels

Discriminant validity refers to whether the items measure the construct in question or other (related) constructs (Gefen and Straub 2005). We evaluated the discriminant validity by comparing the square roots of AVE values to the inter-construct correlations (Fornell and Larcker 1981). Table 2 shows the correlation matrix with the square root of AVE values presented diagonally. As can be seen from the table, the square roots of the AVE values for the variables are consistently greater than the off-diagonal correlation values, suggesting satisfactory discriminant validity between the variables.

<table>
<thead>
<tr>
<th></th>
<th>Communication Overload</th>
<th>Social Media Fatigue</th>
<th>Information Overload</th>
<th>Multitasking Self-Efficacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication Overload</td>
<td>0.79</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Media Fatigue</td>
<td>0.66</td>
<td>0.84</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information Overload</td>
<td>0.57</td>
<td>0.54</td>
<td>0.82</td>
<td></td>
</tr>
<tr>
<td>Multitasking Self-Efficacy</td>
<td>-0.01</td>
<td>-0.20</td>
<td>-0.15</td>
<td>0.87</td>
</tr>
</tbody>
</table>

Table 2. Correlations between latent variables (square root of AVEs in the main diagonal)

We further verified discriminant validity by examining item cross-loadings, presented in Table 3.
All items load higher on their assigned latent construct than on any other construct (Fornell and Larcker 1981). This indicates that discriminant validity at the item level is met for all the constructs (Gefen and Straub 2005).

**Structural Model Test**

Figure 2 shows the results of the structural model test.

Information overload ($\beta=0.21$, $p<0.01$) and communication overload ($\beta=0.54$, $p<0.001$) had significant effects on social media fatigue, supporting H1 and H2. As hypothesised in H3, the interaction term of information overload and multitasking computer self-efficacy ($\beta=-0.14$, $p<0.05$) had a significant negative influence on social media fatigue. Finally, H4 was not supported as the interaction term of communication overload and multitasking computer self-efficacy ($\beta=0.16$, $p<0.01$) had a significant positive effect on social media fatigue. The control variable, gender ($\beta=0.14$, $p<0.05$) had a significant effect on social media fatigue, which suggests that female users experience higher level of social media fatigue. The model with the interaction terms explained 55% of variance, whereas, the direct effect model explained 53% variance in social media fatigue. The F-test suggested that the model with interaction effects explained significantly higher variances than the model with only direct effects.

**Discussions and Implications**

Our study has two theoretical implications. First, we found that both information overload and communication overload significantly affects social media fatigue. Thus, our study supports the findings of Lee et al. (2016). However, in contrast to Lee et al. (2016), our study results show that communication...
overload is more critical to create social media fatigue than information overload is. We think this finding is particularly interesting and makes complete sense. This is because we have ended up with too many communication channels with too many communication requests as the rise of social media continues. Responding to all these channels is an exhaustive task and distracts people from doing their real tasks.

Second, our study results suggest that multitasking computer self-efficacy attenuates the effect of information overload, and reinforces the effect of communication overload on social media fatigue. To the best of our knowledge, this study is the first to test the moderating effects of multitasking self-efficacy on social media overload and fatigue. However, some empirical evidence from prior literature can be found that indirectly supports our findings. For example, in a recent experiment on student performance, Kononova et al. (2016) found that those who had higher preference for multitasking (i.e. higher polychronics) recognised online article content more accurately than those who had lower preference for multitasking (i.e. lower polychronics) in both forced and voluntary multitasking conditions. Lower polychronics showed that checking Facebook freely while reading online was cognitively demanding in compare to higher polychronics. This supports the notion that higher polychronics are better equipped in coping with information overload related fatigue due to their higher multitasking skills. This indirectly supports our finding regarding the attenuating effect of multitasking self-efficacy on the relationship between information overload and social media fatigue. Thus, developing computer multitasking skills may be an effective way to cope with social media overload and fatigue. In fact, Leysens & Parry (2016) discussed that multitasking is a skill that can be acquired and applied for performance gains in certain situation.

Regarding the moderating effect of multitasking computer self-efficacy on the relationship between communication overload and social media fatigue, we hypothesized that multi-tasking computer self-efficacy can attenuate the effect of communication overload on social media fatigue. However, our results show that it can actually reinforce the effect of communication overload on social media fatigue. Communication overload occurs due to interruptions by too many communication demands, and thus may need different coping abilities than information overload. In fact, communication overload may be a symptom of other issue as described by Gallo (2012). It may be an indicator of the ambiguous decision making process in an organization and thus, people get huge amount of communication requests from the peers and others. It may also due to one’s social media use behaviour. For example, one may interrupt dinner to send a “quick email” related to his work from his/her phone, post a status on Facebook, tweet a photo of his/her dinner, and so on. This way an individual opens up the possibilities of too many communication requests. In such situation, individuals with higher multi-tasking computer self-efficacy believe that they can deal with the communication demands, but later realize that dealing with the unnecessary communication requests reduce their efficiency and become fatigued.

Based on the findings from the study, we suggest the following practical implication. We suggest that practitioners need to be aware of the fact that multitasking computer self-efficacy could be in fact a double edged sword, as we find that it can both attenuate and reinforce the effects of social media overload on fatigue. They should keep in mind that improving multitasking computer self-efficacy alone wouldn’t help dealing with fatigue. In fact, it may increase fatigue if it is not managed and utilized carefully. Thus, we recommend practitioners improve their multitasking computer self-efficacy. However, at the same time we recommend them not to live in the fallacy that they are capable of handling too many communications request just because they have developed higher multitasking self-efficacy. They should set strategies like defining the rules of engagement to communication requests. It is obvious that not all communication requests are equally important. Thus, they could make a priority list of communication requests based on their objectives and expectations. We also suggest social media operators help users manage communication requests. For example, they can provide users with a more controllable environment that helps building the priority lists of communication requests as well as provides optional filters to content and communication requests that they do not find particularly interesting.

**Conclusion**

As with any other empirical research, the present study is subject to a number of limitations. At the same time however, the limitations could serve as avenues for further research. First, the study has been conducted amongst Irish student users. This evidently limits generalization of the findings directly to other user groups. Thus, we suggest future research validate our findings by collecting data from other user groups, especially organizational employees. Second, multitasking in our context of study was to
some extent voluntary in nature. In many situations, multitasking is mandatory. For example, in an organizational setting, people are forced to do multitasking. Thus, future research could investigate to what extent our findings are valid in mandatory settings. Third, Maier et al. (2015a) discussed several technology related stressors that influence social media exhaustion. Thus, future research could investigate the moderating role of multitasking self-efficacy in the presence of technology stressors as the control variables. Another area of future research could be investigating the effects of innovative social media features on information overload, communication overload, and social media fatigue. For example, it would be worth investigating to what extent optional filters to content and communication requests help mitigate communication overload and social media fatigue.

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