

The Effect of Overload on Social Network Fatigue and Its User Differences: A Post-Print Analysis

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Abstract

[Purpose / Significance] This study investigates the causes of social network fatigue from an overload perspective, considering differences in gender, age, groups (working group, student group), and usage time, to provide recommendations for ameliorating the phenomenon of social network fatigue. [Method / Process] Data were collected through an online questionnaire (416 responses), and analyzed using structural equation modeling and t-tests. [Results / Conclusion] The results indicate that information overload, social overload, and system overload significantly influence social network fatigue, with information overload exerting the strongest effect, followed by system overload and social overload. Meanwhile, age and group (working group, student group) exhibit differences in the effects of information overload and system overload on fatigue; gender shows differences in the effects of social overload and system overload on fatigue; usage time demonstrates differences in the effects of social overload and system overload on fatigue.

Full Text

Effects of Overload on Social Network Fatigue and User Differences

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Abstract

[**Purpose/Significance**] This study explores the causes of social network fatigue from an overload perspective, considering differences in gender, age, user group (working professionals vs. students), and usage duration to provide recommendations for alleviating this phenomenon. [**Method/Process**] We collected 416 responses through an online questionnaire and analyzed the data using

structural equation modeling and t-tests. **[Result/Conclusion]** The results demonstrate that information overload, social overload, and system overload significantly affect social network fatigue, with information overload having the strongest effect, followed by system overload and social overload. Additionally, age and user group show significant differences in how information overload and system overload impact fatigue; gender exhibits significant differences in how social overload and system overload affect fatigue; and usage duration shows significant differences in how social overload and system overload influence fatigue.

Keywords: social networks; social network fatigue; difference analysis; information overload; social overload; system overload

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1. Introduction

With the rapid development of information technology and social media, social networks have permeated every aspect of work and daily life. Users leverage different social network functions based on various motivations to satisfy diverse needs [1]. However, while social networks provide convenience, they also generate negative consequences, such as user fatigue. When users become overwhelmed by excessive information or spend too much time maintaining online relationships, they tend to avoid social network activities—a phenomenon known as social network fatigue [2]. Empirical evidence indicates that social network users are experiencing information overload, social overload, and related issues [3], which often trigger negative emotions like fatigue and frustration [4]. Furthermore, social network users exhibit behavioral differences based on gender, age, and other demographic factors [5-6]. How do different types of overload influence social network fatigue? What differences exist among various user groups? Addressing these questions will help reveal the underlying mechanisms of negative emotions among social network users and their behavioral variations, thereby guiding interventions to mitigate negative emotions and promote positive behaviors. This research is supported by the Ministry of Education Humanities and Social Sciences Youth Fund Project “Research on the Intermittent Discontinuation Phenomenon and Its Mechanism in Social Media User Behavior” (Project No.: 19YJC870006) and the National Natural Science Foundation Youth Project “Research on Social Media Usage Mechanisms Based on Uses and Gratifications Theory: Behavioral Transition from Adoption to Continued Use” (Project No.: 71403301).

2. Theoretical Foundation and Research Hypotheses

2.1 Theoretical Foundation and Model

Based on the principle of diminishing marginal utility, while information technology can enhance productivity, beyond a certain point, the benefits of technology do not increase but rather decrease. Better technology does not necessarily yield maximum output or performance—a phenomenon termed technology overload [22]. Overload typically involves subjective evaluation and perception of demands exceeding individual processing capacity [23]. With the proliferation and penetration of social networks, users experience overload phenomena during usage.

Previous research has examined overload in social network contexts. P. Karr-Wisniewski and Y. Lu conceptualized technology overload as comprising information overload, communication overload, and system feature overload [22]. A. R. Lee et al. investigated overload antecedents and their effects on social network fatigue from three dimensions: information overload, communication overload, and system feature overload [24]. S. Zhang et al. [25] and S. Shokouhyar et al. [26] both proposed that information overload, social overload, and system overload significantly influence social network fatigue. Drawing on S. Zhang et al. [25], this study examines the effects of overload on social network fatigue across three dimensions—information overload, social overload, and system overload—while considering differences in user group (working professionals vs. students), gender, age, and usage duration. The theoretical model is shown in Figure 1 [Figure 1: see original paper].

2.2 Research Hypotheses

Information Overload. Information overload occurs when users receive more information on social networks than they can process [22]. In social network environments, when users receive excessive information beyond their processing capacity, social network fatigue emerges [27]. Existing research has established the impact of information overload on social network fatigue. W. Chaouali, based on uses and gratifications theory and the person-environment fit model, found that information overload significantly affects emotional fatigue among social network users [28]. W. Gao et al., drawing on protection motivation theory and information processing theory, demonstrated that information overload significantly influences social network fatigue [29]. X. Cao and J. Sun, using an extended stressor-strain-outcome research model, confirmed that social network fatigue is significantly affected by information overload [30]. L. Yu et al. proposed that overload significantly impacts social network fatigue [31]. When confronted with vast amounts of information on social networks, users must expend considerable effort and time extracting and processing information from redundant content, easily leading to fatigue. Therefore, we hypothesize:

H1: Information overload significantly affects social network fatigue.

Social Overload. In social network contexts, frequent social interactions primarily aimed at caring for friends, pleasing them, or solving problems are considered social overload [32]. Research has shown that social overload leads to social network fatigue. C. Maier et al. found that social overload causes social network fatigue and reduces satisfaction [11]. X. Zhu and Z. Bao et al. demonstrated that social overload significantly affects social network fatigue [7]. T. Ravindran suggested that social network fatigue may stem from friends' social dynamics or social interactions on social networks [12]. When users need to provide excessive social support to others, they are more likely to feel overwhelmed and subsequently experience fatigue. Therefore, we hypothesize:

H2: Social overload significantly affects social network fatigue.

System Overload. System overload refers to a given technology being overly complex for a given task [22]. While adding features can make products more distinctive and efficient, excessive functionality may overwhelm users and create overload [33]. Research has examined the relationship between system overload and social network fatigue. S. Shokouhyar et al. argued that system feature overload significantly affects users' social network fatigue [26]. S. Zhang et al. found that system feature overload acts as a stressor causing dissatisfaction and social network fatigue [25]. A. R. Lee et al. proposed that system feature overload significantly influences social network fatigue [24]. When social network functions are too complex or update too frequently, users need to spend more time understanding and adapting to new features, which may cause fatigue. Therefore, we hypothesize:

H3: System overload significantly affects social network fatigue.

3. Research Design

3.1 Scale Design

To ensure questionnaire reliability and validity, all measurement items were adapted from existing studies and refined according to our research context and objectives. Information overload and system overload items were sourced from P. Karr-Wisniewski and Y. Lu [22], social overload items from C. Maier et al. [32], and social network fatigue items from C. Maier et al. [32] and E. Åhsberg [43]. To ensure reliability and validity, we first consulted two experts in library and information science, modifying the context and items based on their feedback. We then conducted a pre-test with 24 social network users and further revised certain items and expressions based on their feedback to produce the final questionnaire. All items were measured using a 7-point Likert scale, where 1 represented "strongly disagree," 4 represented "neutral," and 7 represented "strongly agree."

3.2 Data Collection

This study targeted social network users among students and working professionals. Using an online questionnaire distributed via snowball sampling, we collected 443 responses. After eliminating 27 invalid questionnaires (those with uniform answers or all “strongly agree” / “strongly disagree” responses), we obtained 416 valid questionnaires. Table 1 presents the demographic characteristics of the valid sample, showing that 39.9% were male and 60.1% female; 38.3% were aged 22 or younger and 61.7% were 23 or older; 60.8% held bachelor’s degrees; 83.2% had used social networks for three years or more; 83.4% used them frequently daily; and student and working professional groups comprised 49% and 51% of the sample, respectively.

4. Data Analysis

4.1 Reliability and Validity Analysis

Reliability was assessed using Cronbach’s α coefficient, with values above 0.7 indicating high reliability [44]. Validity analysis included construct validity (convergent and discriminant validity) and content validity. Primary indicators were factor loadings, composite reliability (CR), and average variance extracted (AVE). Factor loadings and CR values above 0.7 indicate high reliability, while the AVE threshold is 0.5 [46]. As shown in Table 2, the scales demonstrated satisfactory reliability and validity. Discriminant validity reflects correlations among different measures; good discriminant validity is established when a variable’s AVE square root (diagonal elements) exceeds its correlations with other variables (off-diagonal elements) [44]. Table 2 confirms strong discriminant validity.

4.3 Difference Analysis

We used Smartpls 3.0 to validate the structural equation model. The results, shown in Figure 2 [Figure 2: see original paper], indicate that social network fatigue explains 51.7% of the variance, with all paths being significant, supporting hypotheses H1, H2, and H3. We then conducted group-specific SEM analyses by age, gender, user group (working professionals vs. students), and usage duration.

Gender Differences. As shown in Table 3, significant gender differences exist in how social overload and system overload affect social network fatigue. Males are more susceptible to social overload-induced fatigue, while females are more vulnerable to system overload-induced fatigue. Although information overload significantly affects fatigue for both genders, no significant gender difference exists for information overload.

Age Differences. Using 23 years as the cutoff, age group differences are presented in Table 4. Significant age differences exist for information overload and system overload. Younger users are more prone to information overload-induced

fatigue, whereas older users are more susceptible to system overload-induced fatigue. While social overload significantly affects fatigue across age groups, no significant age difference exists for social overload.

Group Differences (Working Professionals vs. Students). Table 5 shows group differences. Students and working professionals differ in their experience of social network fatigue. Students are more affected by information overload, while working professionals are more affected by system overload. Additionally, social overload significantly affects fatigue among students but not among working professionals.

Usage Duration Differences. Using three years as the threshold, users were divided into groups with less than three years and three or more years of usage experience, with results shown in Table 6 . Significant differences exist between these groups. Compared to users with three or more years of experience, those with less than three years show stronger effects of social overload and system overload on fatigue. For users with three or more years of experience, information overload affects fatigue, whereas it does not significantly affect those with less than three years of usage.

5. Discussion

5.1 Results Discussion

This study investigates factors influencing social network fatigue and associated user differences, specifically examining the effects of information overload, social overload, and system overload while considering gender, age, user group, and usage duration differences. The results show that information overload significantly affects social network fatigue and has the strongest effect, consistent with findings from W. Chaouali [28] and M. Wang and D. Li [47]. There exists a threshold between information relevance and information overload; beyond this threshold, excessive information causes overload [24]. Social networks are saturated with redundant information, and searching for needed information consumes substantial user time and energy, often resulting in fatigue. For instance, when WeChat group chats contain excessive messages, users must “scroll through” numerous messages to find useful information, which is typically exhausting.

The findings also demonstrate that system overload significantly affects social network fatigue, aligning with research by S. B. Choi and M. S. Lim [4] and A. R. Lee et al. [24]. While information technology development enhances convenience, overly complex software functions and frequent updates create usage difficulties [48]. Users must spend more time learning and adapting to new features, potentially causing social network fatigue.

Meanwhile, social overload significantly affects social network fatigue but has the weakest effect, consistent with studies by X. Xiao and T. Wang [38] and J. Lo [49]. In social networks, users both receive and provide social support. However,

when users must provide excessive social support that consumes too much time and energy, they typically experience fatigue [50]. For example, when users need to respond to messages instantly and maintain connections with friends on social networks, they feel fatigued [51]. Similarly, managing numerous private messages on WeChat may conflict with users' normal life or work, causing fatigue [24].

Furthermore, difference analysis reveals gender differences in how social overload and system overload affect fatigue. Males are more susceptible to social overload-induced fatigue, possibly because they are less adept at managing social relationships than females. Females are more vulnerable to system overload-induced fatigue, potentially due to lower interest in systems and software compared to males.

Age differences exist in how information overload and system overload affect social network fatigue. Younger users are more prone to information overload-induced fatigue, likely because they have less experience processing information and easily become fatigued when facing large volumes of social network content. Older users are more susceptible to system overload-induced fatigue, possibly because they have weaker acceptance of new things and more easily become fatigued by complex system functions.

Group differences exist in how information overload and system overload affect social network fatigue. Students are more affected by information overload, likely because they follow more online information, and excessive content causes fatigue. Working professionals are more affected by system overload, as they prioritize efficiency and complex functions and designs easily cause fatigue. Among working professionals, social overload does not significantly affect fatigue, possibly because social interaction is viewed as a work requirement rather than a source of fatigue.

Usage duration differences exist in how social overload and system overload affect fatigue. Users with three or more years of experience are more affected by social overload and system overload. As usage duration increases, users accumulate more friends and are more likely to experience fatigue from excessive online social interaction. Additionally, long-term users become accustomed to existing functions and are more susceptible to fatigue from system changes. For users with less than three years of experience, information overload does not significantly affect fatigue, possibly because accumulated information remains within their processing capacity.

5.2 Research Significance

This study offers both theoretical and practical contributions. Theoretically, it examines the effects of different overload types on social network fatigue and associated user differences. While previous research has explored overload effects, few studies have explained user behavioral differences, and most have relied on student samples. This study investigates user differences and collects samples

from diverse sources to reveal how gender, age, user group, and usage duration differently impact user behavior, thereby enriching and expanding existing social network user behavior research.

Practically, the findings provide theoretical guidance for social network service providers to more effectively promote positive user behavior. Providers can reduce user fatigue by improving information delivery—for example, by reducing irrelevant advertisements or offering information categorization and organization features to facilitate information filtering. They can also address social overload by implementing user grouping, special alerts, or blocking functions to reduce users' social burdens. Additionally, providers should consider system overload by offering detailed software update guidance to reduce pressure and fatigue caused by new features. Moreover, service providers should consider user differences and offer personalized services for different genders, ages, user groups, and new versus experienced users. For instance, providing software update guidance to long-term “veteran” users can reduce system overload-induced fatigue.

Users themselves can also mitigate social network fatigue by appropriately regulating their information, social, and system engagement. For example, they can filter less important information, block certain chat groups, and manage friend groups to reduce fatigue.

5.3 Research Limitations

This study has several limitations. First, it primarily focuses on overload mechanisms, though many other factors cause social network fatigue, such as fear of missing out. Future research should consider additional psychological factors. Second, this study focuses on the social network context; subsequent research could examine differences across platforms (e.g., Weibo).

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Author Contributions:

Gan Chunmei: Conceptualized the study, designed the framework, revised and finalized the manuscript.

Hu Fengling: Collected and analyzed data, drafted and revised the manuscript.

Note: Figure translations are in progress. See original paper for figures.

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