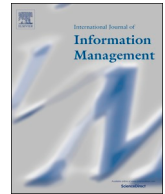




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# Information avoidance behavior on social network sites: Information irrelevance, overload, and the moderating role of time pressure

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## ABSTRACT

Drawing on the stressor-strain-outcome framework, this study investigates how information irrelevance and overload induce social network fatigue, and the relationship of these variables to users' information avoidance behavior. It also examines the conditions under which social network fatigue is more likely to be translated into information avoidance behavior. The analysis of data collected from 341 users of WeChat Moments suggests that information irrelevance directly leads to information avoidance behavior, and social media fatigue as a mediator partially mediates the impact of information overload on information avoidance behavior and fully mediates the impact of social overload on information avoidance behavior. Furthermore, time pressure strengthens the effect of social network fatigue on information avoidance behavior. This study fulfills the identified need for an in-depth investigation of actual discontinuous behavior in social network services (SNSs) by investigating information avoidance behavior and its antecedents. The findings provide SNSs providers with guidelines on how to manage users' behavior so that they remain active users of the SNSs.

## 1. Introduction

Recently, social network services (SNSs) have become ubiquitous in our lives and have received much attention from academics (Alalwan, Rana, Dwivedi, & Algharabat, 2017; Shiau, Dwivedi, & Yang, 2017; Zhang, Zhao, Lu, & Yang, 2016). Currently, after a period of flourishing growth, users' enthusiasm for SNSs has begun to wane, and passive usage behaviors, such as consciously ignoring some messages or avoiding some friends via technical means due to lack of time, energy, knowledge, or personal interest, are becoming increasingly common. For instance, there has been a substantial decrease in the number of active users on many popular SNSs such as Facebook, Twitter, and Myspace. WeChat Moments, the largest SNS provider in China, is facing the same issue. Recently, many WeChat Moment users have expressed negative feelings about SNSs due to boredom and weariness with the large amounts of irrelevant information and excessive demands from friends for "forwards," "thumbs up," and "help do the bargaining." According to the China Internet Network Information Center (CNNIC, 2019), after six years of growth, WeChat Moments experienced a decrease in the use rate from 87.3 % in December 2017 to 83.4 % in December 2018. SNSs providers have tried to develop various functions

and content to retain users, but none have been as effective as hoped.

In studies of this phenomenon, some scholars have investigated what they call the passive use of SNSs (Chen, Tran, & Nguyen, 2019; Han & Myers, 2018; Luqman, Cao, Ali, Masood, & Yu, 2017; Maier, Laumer, Eckhardt, & Weitzel, 2015; Maier, Laumer, Weinert, & Weitzel, 2015; Nisar, Prabhakar, Ilavarasan, & Baabdullah, 2019; Turel, 2016). Other studies refer to discontinuous intention, which is conceptualized as the opposite of continuous use. SNSs are tools for connecting with others (Alalwan et al., 2017; Shiau et al., 2017), and it is not easy for users to stop using them. In fact, more and more users are exhibiting compulsive use habits and are fearful of missing out on important interactions on SNSs (Dhir, Yossatorn, Kaur, & Chen, 2018). Therefore, as it can be difficult for users to check each message on a social network, they may skim or skip irrelevant information or even avoid some information. That means users typically exhibit ignoring and avoidance behaviors before they stop using an SNS or switch to an alternative network. Zhang et al. (2016) suggested that although behavioral intention is usually regarded as an effective predictor of actual behavior, in-depth investigation is needed to understand actual discontinuous behavior. This study answers this call by focusing on users' information avoidance behavior and the antecedents of this behavior. Drawing on

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the concept of advertising avoidance (Cho, 2004; Shin & Lin, 2016; Speck & Elliott, 1997), information avoidance behavior is defined as a kind of passive behavior in which users consciously ignore some information and avoid some friends' information due to lack of time, energy, knowledge, or personal interest.

Although recent studies have identified several factors and motives leading to discontinuous intentions, including environmental stimuli such as a perceived overload (Maier, Laumer, Eckhardt et al., 2015; Maier, Laumer, Weinert et al., 2015; Ravindran, Yeow Kuan, & Hoe Lian, 2014; Zhang et al., 2016) and psychological factors such as fatigue, dissatisfaction, and regret (Cao & Sun, 2018; Ravindran et al., 2014; Zhang et al., 2016), few studies have looked at the impact of aspects of the information content of SNSs, such as information irrelevance, on users' emotions and behavioral responses. Previous studies have generally agreed that social network fatigue directly results in discontinuous behavior (Zhang et al., 2016). Furthermore, users' perceptions of overload have been found to be one of the determinants of social network fatigue (Cao & Sun, 2018; Chen et al., 2019; Maier, Laumer, Eckhardt et al., 2015; Maier, Laumer, Weinert et al., 2015; Ravindran et al., 2014). Previous studies have argued that SNS fatigue plays a mediating role in the relationship between perceived overload and discontinuous intentions (Maier, Laumer, Eckhardt et al., 2015; Maier, Laumer, Weinert et al., 2015; Zhang et al., 2016). However, it is not clear whether social network fatigue has a full or partial mediating effect on the impact of overload on SNSs discontinuous intentions. In addition, although SNS fatigue is obviously an important issue, few studies have systematically examined the conditions under which social network fatigue is more likely to translate into passive usage behavior. This study addresses these research gaps by examining the following two questions: (1) How do information irrelevance and SNSs overload affect users' information avoidance behavior? (2) Under what conditions will the effects of social network fatigue on information avoidance behavior become more pronounced? Drawing upon the stressor-strain-outcome (SSO) framework, we develop a theoretical model to examine how information irrelevance and SNSs overload induce social network fatigue, and how these factors further motivate information avoidance behavior. The results show that information irrelevance directly leads to information avoidance behavior, and social media fatigue as a mediator, partially mediates the relationship between social overload and avoidance behavior and fully mediates the relationship between information overload and avoidance behavior. When an individual's time pressure increases, the effect of social network fatigue on information avoidance behavior increases.

This study makes important contributions to the literature on passive SNSs use and discontinuous behavior by investigating users' information avoidance behavior and the factors leading to it. Specifically, first, although previous studies have identified several factors influencing SNSs discontinuous usage intentions (Cao & Sun, 2018; Chen et al., 2019; Zhang et al., 2016), the impact of information irrelevance has never been studied. In this study, we identify information irrelevance as the new antecedent of information avoidance behavior in SNSs usage. Second, although social overload and information overload have been found to potentially induce SNSs fatigue and discontinuous intentions (Chen et al., 2019; Luqman et al., 2017; Zhang et al., 2016), our study confirms and extends prior research by showing that social overload and information overload can also lead to users' information avoidance behavior in SNSs usage. In addition, this study extends previous research by verifying that social network fatigue fully mediates the impact of social overload on information avoidance behavior and partially mediates the impact of information overload on information avoidance behavior. Third, by examining the moderating effect of time pressure, this work provides a more comprehensive understanding of the mechanisms underlying information avoidance behavior in SNSs usage. These findings will help SNSs providers to better understand users' feelings, usage behaviors, and the factors affecting their use of a social network. This knowledge may help SNSs providers maintain the active

use of SNSs.

The rest of the paper is organized as follows. First, we review the literature relating to information avoidance behavior, social network fatigue, information irrelevance, and overload. Second, we develop a research model and articulate the corresponding hypotheses. Third, we describe our constructs and data collection method and present our data analysis procedures and the results of the model testing. Finally, we discuss the findings and their theoretical and practical implications.

## 2. Theoretical background

### 2.1. Theoretical framework

The stressor-strain-outcome (SSO) model was used as a framework to explain SNSs users' information avoidance behavior. The SSO framework has been commonly used for studying stress-related situations and their outcomes in the context of technology use (Ayyagari, Grover, & Purvis, 2011; Dhir et al., 2018; Ragu-Nathan, Tarafdar, Ragu-Nathan, & Tu, 2008), which is exactly in line with the main purpose of this study, i.e., to investigate how stress-related factors trigger users' information avoidance behavior in SNSs usage (outcome). We thus rely on the SSO model as an overarching framework.

There are three main components in the SSO framework, namely stressor, strain, and outcome. Stressors are factors that create stress. In this study, we consider users' perceived overload and information irrelevance as stressors. Strain is the psychological outcome of stress in individuals, and this study considers social network fatigue as the focal strain. Information avoidance behavior is the outcome of strain, and it is a behavioral response to a stressful situation. According to this framework, we argue that users' perceptions of SNSs overload and information irrelevance (stressor) create social network fatigue (strain), which further leads to information avoidance behavior (outcome).

### 2.2. Information avoidance behavior

The activeness and loyalty of users have a far-reaching impact on the survival and development of an SNS (Chiu & Huang, 2015). Given the importance of users, a rich and extensive literature has explored the continuous intentions of SNSs users (Shiau et al., 2017; Zhou, Cai, Liu, & Fan, 2019), and summarized the factors influencing SNSs continuous use (Shiau et al., 2017; Shiau, Dwivedi, & Lai, 2018). Currently, SNSs users encounter complex social relations, a huge amount of information, and "meticulous" push services, which can overwhelm users' limited information receiving and processing capacities. Consequently, users' adoption and continuous use of SNSs can develop first into excessive use (Cao & Yu, 2019), and then into a variety of passive usage behaviors such as ignoring, resisting, avoiding, transferring, and finally withdrawing. Previous studies of the passive use of SNSs often simply refer to it as discontinuous use, which is conceptualized as the opposite of continuous use (Luqman et al., 2017; Zhang et al., 2016). In an SNS context, discontinuous intention refers to a user's intention to stop using an SNS either permanently or temporarily (Zhang et al., 2016). Social network sites allow users to connect with other people, and it is not easy for users to stop using them. Some users may exhibit compulsive use and fear missing out on important interactions on SNSs (Dhir et al., 2018). Therefore, as it can be difficult for users to check each message on a social network, they may skim or skip irrelevant information or even avoid some information. Thus, users may exhibit information avoidance behavior before they make a decision to withdraw from a social network.

In the advertising field, some studies have analyzed why users avoid advertisements on the Internet. They have proposed the concept of advertising avoidance to describe consumers' active avoidance of advertising rather than simply a lack of attention (Cho, 2004; Shin & Lin, 2016; Speck & Elliott, 1997). These actions may include scrolling down Web pages to avoid banner advertising, purging pop-up advertising,

clicking away from ad pages containing banners, and so forth (Cho, 2004). Drawing on the concept of advertising avoidance, this study examines information avoidance behavior in SNSs, which is defined as a kind of passive usage behavior in which users consciously ignore and avoid some information due to lack of time, energy, knowledge, or personal interest.

### 2.3. Social network fatigue

The phenomenon of social network fatigue has attracted the attention of many researchers (Dhir et al., 2018; Dhir, Kaur, Chen, & Pallesen, 2019). Medical studies suggest that fatigue is a multi-dimensional phenomenon that represents a subjective and unpleasant feeling (Piper, Lindsey, & Dodd, 1987). In the context of a social network, Zhang et al. (2016) defined social network fatigue as negative emotional reactions, such as tiredness, boredom, burnout, indifference, and lower interest, to social network activities. Social network fatigue arises when users get tired of the many functions and dense content on social media platforms and seek to escape (Bright, Kleiser, & Grau, 2015). Zheng and Lee (2016) suggested that the pervasiveness of SNSs results in excessive use, which may have several negative outcomes, such as user fatigue and strain.

Social network fatigue is usually regarded as the result of overload, and several empirical studies have examined the relationship between overload and fatigue (Ravindran et al., 2014; Zhang et al., 2016). Additionally, social network fatigue is an important driver of discontinuous usage intention and behavior (Ravindran et al., 2014; Yao & Cao, 2017). For example, Yao and Cao (2017) suggested that users' SNS-induced stress could lead to behavioral responses such as temporary rest, use control, and use termination. Social network fatigue is regarded as a mediator of the relationship between users' cognitions and discontinuous use (Zhang et al., 2016). This study attempts to examine whether social network fatigue fully or partially mediates the relationship between users' cognition and behavior.

### 2.4. Information irrelevance

One dimension of information quality, relevance, has received much attention in the literature (Luqman et al., 2017; McKinney, Yoon, & Zahedi, 2002). The concept of information quality was presented in DeLone & McLean's (1992) IS success model; it is defined as the desirable characteristics of the information output of an IS. Studies (DeLone & McLean, 1992; DeLone & McLean, 2003; Petter, DeLone, & McLean, 2013) have also identified the dimensions of information quality, including information accuracy, completeness, consistency, precision, and relevance. In an IS context, relevance is the extent to which information can be used to perform a task and to produce a qualitative outcome (Laumer, Maier, & Weitzel, 2017). Some scholars have used DeLone and McLean's IS success model in the fields of social networking and mobile banking to investigate users' actual usage behavior (Sharma & Sharma, 2019).

In the SNS contexts, information relevance is the extent to which information in a SNS is helpful and applicable to an SNS user's needs (Lee, Son, & Kim, 2016; McKinney et al., 2002). Based on this definition of information relevance, this study defines information irrelevance as the extent to which information in a SNS is irrelevant, unimportant, petty, and inapplicable to an SNS user's needs. Although the literature has identified several antecedents of discontinuous intention, few studies have examined the impact of information irrelevance on the passive usage intentions and behaviors of SNSs users. This study investigates the influence of information irrelevance on social network fatigue and information avoidance behavior.

### 2.5. Perceived overload on SNSs

Based on the technology overload framework proposed by Karr-

Wisniewski and Lu (2010); Zhang et al. (2016) proposed three types of overload in the SNS context: system feature overload, information overload, and social overload. System feature overload is the perception that the features provided by the SNS platform exceed the users' demands (Thompson, Hamilton, & Rust, 2005; Zhang et al., 2016). Information overload reflects the condition in which the large amount of information on an SNS exceeds an individual's capacity to process it (Zhang et al., 2016). Social overload is defined as the perception of crowding in an online space. In this condition, users feel that there are too many social demands and that they must invest too much time and attention to maintain relationships with the growing number of contacts in the online social network (Zhang et al., 2016). As this study uses WeChat Moments as the study context, it does not consider the system feature overload. As of December 2017, the utilization rate of WeChat Moments reached 87.3% in China (CNNIC, 2018). The extensive use of WeChat Moments means that the systems feature overload is not a concern in this sample. Thus, we consider social overload and information overload as perceived types of social network overload on WeChat Moments.

Overload has been identified as a key element in some negative outcomes, such as anxiety, exhaustion, regret, fatigue, and so on (Maier, Laumer, Eckhardt et al., 2015; Maier, Laumer, Weinert et al., 2015; Ragu-Nathan et al., 2008). It can contribute to the feeling of fatigue, which leads to users' discontinuous intentions or behavior. However, it is not clear if overload indirectly or directly influences users' negative behavioral responses.

## 3. Research model and hypothesis

### 3.1. Social network fatigue and information avoidance behavior

Social network fatigue has attracted the attention of many researchers. Recently, researchers have found that SNS fatigue may be an important driver of discontinuous usage intention (Ravindran et al., 2014; Zhang et al., 2016). The various information and social demands of SNSs may overwhelm users' capacity. Users may feel tired after spending too much energy dealing with these demands, and may practice information avoidance behaviors to escape from negative emotions and fatigue. Thus, we propose the following hypothesis.

**H1.** Social network fatigue is positively related to information avoidance behavior.

### 3.2. Information irrelevance as an antecedent

Providing information is the main service of SNSs, so the quality of information determines whether users get their expected returns. One dimension of information quality, relevance, has received much attention in the literature (McKinney et al., 2002). When a user receives information that is irrelevant to their interests, the chances of experiencing social network fatigue are high. That is, users do not want to deal with content that is irrelevant to their interests, unimportant, or petty. If a user is frequently exposed to irrelevant information, she may experience a P-E misfit, which is a misfit between environmental supplies and personal motives, goals, and values (Edwards, 1996). Therefore, higher the information irrelevance leads to a greater P-E misfit, and hence higher levels of social network fatigue. Consequently, we propose the following hypothesis.

**H2a.** Information irrelevance is positively related to social network fatigue.

Together, H1 and H2a suggest that social network fatigue may mediate the relationship between information irrelevance and information avoidance behavior. This study examines whether social network fatigue is a partial mediator, as information irrelevance could bypass social network fatigue and directly lead to information

avoidance. It is possible that users directly avoid someone who always publishes irrelevant messages or actively neglect posts that are irrelevant. Therefore, information irrelevance could directly induce users' information avoidance behavior. On the basis of above analysis, we propose the following hypothesis.

**H2b.** Social network fatigue partially mediates the effect of perceived information irrelevance on information avoidance behavior.

### 3.3. Perceived overloads as antecedents

Recent studies have seen social network fatigue as a result of overload and as an antecedent to discontinuous usage intention (Ravindran et al., 2014; Zhang et al., 2016). SNSs allow relationship forming between users from distinct backgrounds, resulting in massive amounts of information (Kapoor et al., 2018). The drawbacks of information overload include users' inability to find credible information of use when necessary (Kapoor et al., 2018), as well as time pressure and negative psychological consequences (Dwivedi et al., 2018). The relationship between information overload and fatigue has been empirically validated in previous studies (Gao, Abel, Houben, & Yu, 2012; Ravindran et al., 2014; Zhang et al., 2016). For example, Zhang et al. (2016) demonstrated that perceptions of high levels of cyber-based information overload can lead to social network fatigue. Dealing with too much information exhausts users' mental resources, energy, and interest, and leads to fatigue. Thus, we propose the following hypothesis.

**H3a.** Information overload is positively related to social network fatigue.

Together, H1 and H3a suggest that social network fatigue may mediate the relationship between information overload and information avoidance behavior. In this study, we examine whether social network fatigue may also be a partial mediator, as information overload could bypass SNS fatigue and directly induce information avoidance behavior. It is possible that users directly avoid SNSs because they do not have enough time and energy to process the messages and information. Moreover, the large amount of redundant information may interfere with the accuracy of users' selection of relevant information. If this occurs, rational users may choose to avoid or neglect some information. Thus, we propose the following hypothesis.

**H3b.** Social network fatigue partially mediates the effect of perceived information overload on information avoidance behavior.

Social overload might explain why an increasing number of SNS users feel fatigue when using an SNS. According to the conservation of resource (COR) theory, fatigue arises when individuals' resource inputs and outputs are not balanced (Wright & Hobfoll, 2004). Users may feel fatigue when faced with too many social support requests that they do not have the energy or time to process (Karr-Wisniewski & Lu, 2010). Additionally, social overload is usually associated with compulsive use of SNSs, which is found to be related to a negative affect and stress levels (LaRose, Connolly, Lee, Li, & Hales, 2014). Previous studies have suggested that social overload is positively related to social network fatigue (Zhang et al., 2016). Hence, we develop the following hypothesis.

**H4a.** Social overload is positively related to social network fatigue.

Together, H1 and H4a suggest that social network fatigue may mediate the relationship between social overload and information avoidance behavior. This study examines whether social network fatigue is a partial mediator, as social overload may directly induce information avoidance behavior. It is possible that users directly avoid some friends or neglect social demands because they do not have enough time and energy to process them. Additionally, excessive social demands may interrupt and distract users' attention from their daily

work and give rise to avoidance behavior (Jacobson, Mortensen, & Cialdini, 2011). Therefore, we propose the following hypothesis.

**H4b.** Social network fatigue partially mediates the effect of perceived social overload on information avoidance behavior.

### 3.4. Moderating effect of time pressure

Although social network fatigue may lead to information avoidance behavior, it is possible that the effect of social network fatigue on information avoidance behavior may depend on moderating factors, such as time pressure. Time pressure is the perception that there is an inadequate amount of time available to do all that needs to be done. Time pressure is both a cognitive awareness of not having enough time and an emotional experience of rushing, hurriedness, and frustration (Szollos, 2009). Time pressure has been extensively studied in the behavioral literature, and is known to influence consumers' decision making in various ways (Suri & Monroe, 2003). According to time allocation theory (Rojas-Mendez & Davies, 2005), time pressure is related to time allocation, which is the need to purposively allocate time between competing options. It can be expected to be relevant to decisions about information avoidance behavior. In the SNS context, users with higher levels of time pressure will feel they do not have enough time to use SNSs. Under the same level of fatigue, users with higher levels of time pressure may be more likely to engage in SNSs avoidance behavior than users with lower levels of time pressure. That is, time pressure may moderate the relationship between SNSs fatigue and avoidance behavior. Thus, this study proposes the following hypothesis.

**H5.** Time pressure moderates the impact of social network fatigue on information avoidance behavior. The impact of social network fatigue is strengthened by higher time pressure and weakened by lower time pressure.

Fig. 1 illustrates the theoretical model and hypotheses. Based on the stressor-strain-outcome framework, we theorize that users' perceptions of information irrelevance, social overload and information overload are positively related to social network fatigue and information avoidance behavior. Moreover, the relationship between social network fatigue and information avoidance behavior is expected to be positively moderated by time pressure. Some demographic variables (i.e., gender, age, occupation, and education) and aspects of experience with WeChat Moments (i.e., number of friends, tenure) that may affect information avoidance behavior have been included in the research model as control variables

## 4. Research methodology

### 4.1. Construct operationalization

To test our proposed model, we used the survey method and developed a questionnaire. To ensure content validity, all of the items in our questionnaire were derived from existing validated scales. We made some modifications to make these items more suitable for our context. All of the items were measured using a 7-point Likert scale. The measurement scales for social overload were adapted from Maier, Laumer, Eckhardt et al. (2015, Maier, Laumer, Weinert et al., 2015) and Zhang et al. (2016). The measurement scales for information overload and social network fatigue were both adapted from Zhang et al. (2016). For information irrelevance, we adapted the measures from Lee et al. (2016). Time pressure was measured using the items in Dapkus (1985). Finally, the measurement scales for information avoidance were adapted from Cho (2004) and Shin and Lin (2016).

As the original measurement scales are all in English, we used a back-translation method to convert the original English versions to Chinese. We invited three experts from academia and industry to examine the questionnaire. Several measurement items were corrected or

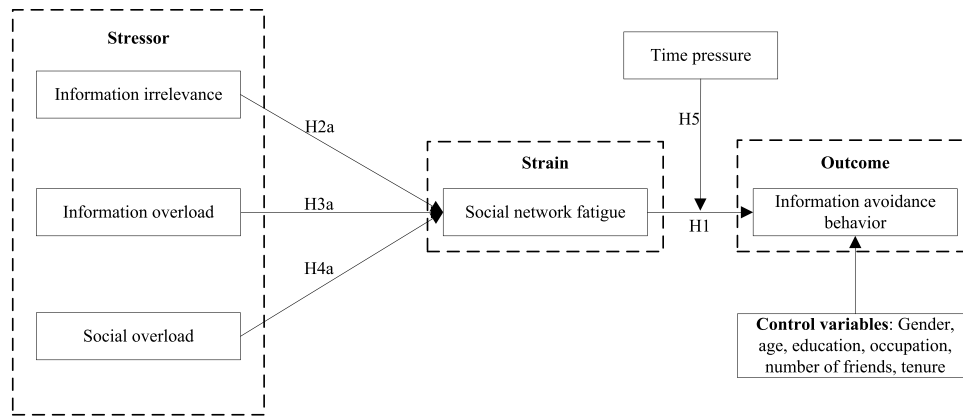


Fig. 1. A theoretical model on the influencing factors of SNS users' information avoidance behavior based on stressor-strain-outcome (SSO) model. Notes: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ ; ns - non-significant; nonsignificant paths are shown with dashed lines.

improved to ensure that the questionnaire was easy to understand. A pilot study was conducted on 50 respondents to assess the validity of the constructs, and a few items with factor loadings lower than 0.7 were adjusted. The final measurement items are listed in the Appendix (Table A1).

4.2. Data collection

Users of WeChat Moments were recruited for this study. WeChat is the most popular social application in China, and WeChat Moment is an SNS embedded in WeChat. WeChat Moments offers sets of services similar to those offered by Facebook and Twitter. According to Tencent's 2018 annual report (Tencent, 2018), WeChat Moments is the most popular mobile social platform in China, with more than one billion active daily users all over the world in 2017. More than 750 million users read posts on WeChat Moments every day (Tencent, 2018). Previous studies of SNSs have chosen WeChat Moments users as research samples, such as Wang (2017) and Shao and Pan (2019).

The questionnaires were collected at one university in China through an online survey in March 2019. We majorly invited college students to participate in the survey, since college students comprise the largest portion of social media users and represent the most active users in the mobile social platform (CNNIC, 2019; Gan, 2017; Shao & Pan, 2019). Thus, the age of most respondents ranged from 19 to 29 years. An incentive of 10 RMB was offered to the respondents who participated in the survey. We totally contacted 400 respondents, and 379 questionnaires were returned. Of this, 38 invalid questionnaires were discarded based on the following criteria: (1) Too much items were unanswered; (2) The respondents gave the same answers to all items; (3) The respondents completed the questionnaire in very short time (e.g., no more than 60 s). After removing invalid responses, we had 341 valid responses. Table 1 shows the summary of the respondents' demographics and experience with WeChat Moments.

To check for non-response bias, we compared the differences between the first 25 percent and the final 25 percent responses and the differences between usable responses and deleted responses based on Armstrong and Overton (1977) and Xu, Luo, and Hsu (2019). The t-tests results are listed in the Appendix (Table A2). As shown in Table A2, the results show that there are no significant differences, indicating that non-response bias was not a serious threat for this study.

4.3. Data analysis and results

We use the structural equation modeling (SEM) method to examine the research model. We use SmartPLS 2.0 as the primary statistical tool to analyze the measurement quality and the path model for two main reasons. First, a PLS approach is more appropriate because our data are

Table 1 Descriptive statistics of respondents.

Respondents	Category	Count	%
Gender	Male	151	44.28 %
	Female	190	55.72 %
Age	18 or below	8	2.35 %
	19–29	263	77.13 %
	30–40	56	16.42 %
	41 or above	14	4.11 %
Education	High school or below	17	4.99 %
	Undergraduate degree	261	76.54 %
	Postgraduate degree or higher	63	18.48 %
Occupation	Student	255	74.78 %
	Staff	59	17.30 %
	Freelancer	21	6.16 %
	Others	6	1.76 %
Tenure	< 1 years	9	2.64 %
	1–2 years	50	14.66 %
	2–3 years	122	35.78 %
	> 3 years	160	46.92 %
Frequency	None	15	4.40 %
	1–2 times a day	102	29.91 %
	3–15 times a day	179	52.49 %
	> 15 times a day	45	13.20 %
Duration of each visit	< 1 min	31	9.09 %
	1–3min	164	48.09 %
	4–10min	102	29.91 %
	> 10min	44	12.90 %
Number of friends	< 100	98	28.74 %
	100–150	97	28.45 %
	151–300	84	24.63 %
	> 300	62	18.18 %

not normally distributed, while covariance-based approaches require a normal distribution (Chin, 1998; Ringle, Sarstedt, & Straub, 2012). Second, a PLS approach is typically used when the investigation phenomenon is new and exploratory. Although SSO framework is used for explaining the factors leading to information avoidance behavior, the definition and measurement of information avoidance behavior have never been studied in IS field. This study adapted the definition and measurement of information avoidance behavior from advertising avoidance research (Cho, 2004). A PLS approach was thus more suited to this study because of the exploratory nature of information avoidance behavior in SNSs usage. Moreover, PLS can be used to assess the impact of common method bias on research results (Furneaux & Wade, 2011; Liang, Saraf, Hu, & Xue, 2007; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Thus, a PLS approach was chose for data analysis.

4.4. Quality of measurement model

The measurement model is examined to assess the reliability,

**Table 2**  
Measurement quality model.

Construct	Items	loadings	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)
Social overload (SO)	SO1	0.838	0.861	0.905	0.705
	SO2	0.817			
	SO3	0.868			
	SO4	0.836			
Information overload (IO)	IO1	0.866	0.871	0.921	0.795
	IO2	0.904			
	IO3	0.904			
Information irrelevance (IIR)	IIR1	0.845	0.844	0.906	0.762
	IIR2	0.89			
	IIR3	0.884			
Social network fatigue (SNF)	SNF1	0.829	0.832	0.886	0.661
	SNF2	0.834			
	SNF3	0.817			
	SNF4	0.77			
Time pressure (TP)	TS1	0.927	0.883	0.927	0.810
	TS2	0.899			
	TS3	0.873			
Information avoidance behavior (IAB)	IAB1	0.843	0.841	0.894	0.680
	IAB2	0.861			
	IAB3	0.874			
	IAB4	0.711			

convergent validity, and discriminant validity of the latent variables. Table 2 illustrates the factor loadings, composite reliability, Cronbach's alpha, and average variance extracted (AVE) of all of the constructs in the model. Reliability reflects the consistency between items that measure the same construct. If the values of both the Cronbach's  $\alpha$  and composite reliability are greater than 0.7, then the reliability is acceptable (Chin, Marcolin, & Newsted, 2003). Table 2 shows that the lowest composite reliability score is 0.886 and the lowest Cronbach's alpha value is 0.832, indicating acceptable internal reliability.

Convergent validity is the degree to which the measurement scales are related to the corresponding construct, and is assessed by checking the AVE of each construct from its indicators. As illustrated in Table 2, the lowest AVE score is 0.661, which is above the recommended value of 0.5, indicating a good convergent validity of the constructs (Pavlou & Fygenon, 2006).

Discriminant validity is the degree to which items distinguish between constructs. There are two methods for assessing discriminant validity. The first method is to compare the square root of the AVE of each construct and its correlation with other constructs. In Table 3, the diagonal values are the square roots of the AVEs for each construct; they are greater than the correlations with all of the other constructs, suggesting a good discriminant validity. The second method to assess discriminant validity is to compare the item loadings of each construct and the cross-loadings of any other constructs. The results presented in Table 4 suggest that the item loadings are higher on their corresponding constructs than on other constructs (Chin et al., 2003; Gefen & Straub, 2005). Specifically, the differences between loadings on principle factors and on other constructs are all higher than the threshold (i.e., 0.1)

**Table 3**  
Correlation analysis of latent variables and square root of the AVE.

	SO	IO	IIR	SNF	TP	IAB
SO	<b>0.840</b>					
IO	0.547	<b>0.891</b>				
IIR	0.355	0.464	<b>0.873</b>			
SNF	0.484	0.485	0.452	<b>0.813</b>		
TP	0.268	0.251	0.227	0.217	<b>0.900</b>	
IAB	0.221	0.331	0.567	0.369	0.300	<b>0.824</b>

Notes: The bold numbers represent the square root of the AVE.

**Table 4**  
Cross loadings of latent variables.

	SO	IO	IIR	SNF	TP	IAB
SO1	<b>0.838</b>	0.446	0.315	0.402	0.211	0.225
SO2	<b>0.817</b>	0.389	0.211	0.380	0.236	0.135
SO3	<b>0.868</b>	0.477	0.308	0.399	0.239	0.202
SO4	<b>0.836</b>	0.517	0.346	0.442	0.217	0.175
IO1	0.538	<b>0.866</b>	0.382	0.492	0.212	0.280
IO2	0.458	<b>0.904</b>	0.426	0.384	0.238	0.288
IO3	0.458	<b>0.904</b>	0.434	0.409	0.221	0.316
IIR1	0.384	0.463	<b>0.845</b>	0.418	0.207	0.453
IIR2	0.255	0.371	<b>0.890</b>	0.367	0.158	0.512
IIR3	0.293	0.383	<b>0.884</b>	0.400	0.228	0.518
SNF1	0.373	0.412	0.491	<b>0.829</b>	0.230	0.377
SNF2	0.449	0.451	0.328	<b>0.834</b>	0.191	0.355
SNF3	0.391	0.364	0.357	<b>0.817</b>	0.135	0.270
SNF4	0.356	0.329	0.254	<b>0.770</b>	0.128	0.137
TP1	0.253	0.230	0.247	0.190	<b>0.927</b>	0.311
TP2	0.289	0.239	0.188	0.207	<b>0.899</b>	0.216
TP3	0.190	0.210	0.169	0.193	<b>0.873</b>	0.266
IAB1	0.220	0.318	0.503	0.355	0.288	<b>0.843</b>
IAB2	0.139	0.272	0.481	0.295	0.211	<b>0.861</b>
IAB3	0.198	0.301	0.493	0.312	0.308	<b>0.874</b>
IAB4	0.169	0.184	0.382	0.246	0.159	<b>0.711</b>

suggested by Gefen and Straub (2005) for how to evaluate item cross-loadings in PLS results. In fact, all of the 105 cross-loading differences were higher than 0.3, indicating reasonable discriminant validity. We also performed exploratory factor analysis and found a similar factor structure with eigenvalues ranging from 1.002–7.318 for the constructs. Thus, all the results suggest an acceptable measurement model.

4.5. Common method bias test

As the data are self-reported, three methods are used to examine the problem of common method bias in this study. First, we conduct Harman's single-factor test for common method bias (Podsakoff et al., 2003; Zhou, Fang, Vogel, Jin, & Zhang, 2012). Our Harman's single factor test generates six factors with eigenvalues greater than one, and the largest one captures only 34 % of the variance, with no single factor accounting for the majority of the variance in the items (Podsakoff et al., 2003; Zhou et al., 2012). Second, based on the study by Liang et al. (2007), the authors of this study add a common method factor with indicators that include all of the principal constructs' indicators in the structural model. We calculate whether each indicator's variances can be substantively explained by the principal construct. The results are illustrated in Table 5 ( $R_1^2$  represents indicators' variances explained by the principle constructs;  $R_2^2$  represents indicators' variances explained by the method construct). The results indicate that all of the substantive factor loadings are significant, whereas most of the method factor loadings are insignificant. The average substantively explained variance of the indicators is 0.736, whereas the average method-based variance is 0.008. The ratio of substantive variance to method variance is about 92:1. The evidence collectively suggests that common method bias is not a serious threat to the validity of the data. Finally, we assessed method bias using the procedure that Lindell and Whitney (2001) recommend. Tenure, which refers to the years of WeChat Moment usage, was selected as an "MV maker" (a proxy for method variance) (Lindell & Whitney, 2001). A marker variable or a scale is theoretically unrelated to other scales (Lindell & Whitney, 2001; Siemsen, Roth, & Oliveira, 2010). We used this unrelated variable to partial out the correlations caused by common method bias (Srinivasan & Swink, 2018). Table 6 shows that the correlations between all independent variables and dependent variable are high and significant, and the correlation between the marker variable and dependent variable is nonsignificant ( $\beta = 0.098, p > 0.05$ ) before adjustment. As shown in Table 6, there were minimal differences between adjusted and

**Table 5**  
Common method bias tests.

Construct	Indicator	Substantive Factor Loading (R <sub>1</sub> )	R <sub>1</sub> <sup>2</sup>	Method Factor Loading (R <sub>2</sub> )	R <sub>2</sub> <sup>2</sup>
Social overload	SO1	0.822**	0.676	0.021	0.000
	SO2	0.904**	0.817	-0.105*	0.011
	SO3	0.871**	0.759	-0.002	0.000
	SO4	0.762**	0.581	0.087	0.008
Information overload	IO1	0.763**	0.582	0.109*	0.012
	IO2	0.968**	0.937	-0.067	0.004
	IO3	0.938**	0.880	-0.033	0.001
Information irrelevance	IIR1	0.764**	0.584	0.108	0.012
	IIR2	0.996**	0.992	-0.098*	0.010
	IIR3	0.885**	0.783	-0.005	0.000
Social network fatigue	SNF1	0.663**	0.440	0.178**	0.032
	SNF2	0.721**	0.520	0.118*	0.014
	SNF3	0.892**	0.796	-0.069	0.005
	SNF4	0.979**	0.958	-0.219**	0.048
Time pressure	TP1	0.905**	0.819	0.024	0.001
	TP2	0.917**	0.841	-0.002	0.000
	TP3	0.879**	0.773	-0.023	0.001
Information avoidance behavior	IAB1	0.776**	0.602	0.089	0.008
	IAB2	0.904**	0.817	-0.059	0.003
	IAB3	0.854**	0.729	0.023	0.001
	IAB4	0.762**	0.581	0.06	0.004
<b>Average</b>		<b>0.854</b>	<b>0.736</b>	<b>0.006</b>	<b>0.008</b>

Notes: \* p < 0.05; \*\* p < 0.01.

**Table 6**  
Correlation Matrix with marker variable (MV) and other main constructs.

	SO	IO	IIR	SNF	TP	Tenure <sup>a</sup>	IAB
SO	1						
IO	0.543**	1					
IIR	0.353**	0.466**	1				
SNF	0.480**	0.474**	0.437**	1			
TP	0.271**	0.252**	0.222**	0.209**	1		
Tenure <sup>a</sup>	-0.092	0.05	0.099	-0.110*	0.073	1	
IAB	0.218**	0.322**	0.560**	0.344**	0.283**	0.098	1
	0.177**	0.286**	0.537**	0.309**	0.245**	0.051	

Notes: <sup>a</sup> This is a method variance marker; \*p < 0.05, \*\*p < 0.01; The values in the last line is the correlation corrected for method bias.

unadjusted correlations, and all adjusted correlations of independent variables with information avoidance behaviour were still significant. These results suggest that common method variance is unlikely to be affecting a large majority of the results.

Causality is an important aspect that must be addressed prior to hypothesis testing (Abdallah, Goergen, & O'Sullivan, 2015; Dubey, Gunasekaran, Childe, Blome, & Papadopoulos, 2019). By using WarpPLS 5.0, this study examined the nonlinear bivariate causality direction ratio (NLBCDR) based on the suggestions of Kock (2015). The NLBCDR is a measure of the extent to which bivariate nonlinear coefficients of association provide support for hypothesized directions of the causal links in the proposed theoretical model (Kock, 2015). The results indicate that the value of NLBCDR is 0.875, which is greater than the acceptable value of 0.7, indicating that endogeneity is not a serious threat for this study.

#### 4.6. Structural path analysis

We next examine the structural model in SmartPLS 2.0 to analyze the path relationship between constructs. We use the bootstrapping method to estimate the path significance coefficient levels. Fig. 2 illustrates the results of the analysis of the structural model. The analysis of the structural model suggests that all of the endogenous and control variables can explain 35.4 % of the variance in social network fatigue and 25.9 % of the variance in information avoidance behavior,

indicating that the research model has good explanatory power (Gefen, Straub, & Boudreau, 2000; Hulland, 1999). Next, we add six control variables (age, gender, education, occupation, number of friends and tenure) to the model. Of the six control variables, only the number of friends has a significant effect on information avoidance behavior ( $\beta = 0.118$ ,  $p < 0.05$ ). Therefore, we argue that when a user has more friends in a social network, he/she is more likely to exhibit avoidance behavior.

As shown in Fig. 2, most of the hypotheses are supported. Social network fatigue is significantly related to information avoidance behavior ( $\beta = 0.289$ ,  $p < 0.001$ ), supporting H1. The path between information irrelevance and social network fatigue is significant ( $\beta = 0.254$ ,  $p < 0.001$ ), supporting H2a. Similarly, H3a and H4a are supported.

##### 4.6.1. Mediation effect test

To test the hypothesized mediating effects, this study adopts the method described by Zhao, Lynch, and Chen (2010) to test whether social network fatigue fully or partially mediates the relationship identified in the above section. Many previous studies have used Baron and Kenny's (1986) causal step regression method to test the mediation effect; however, scholars have recently questioned the accuracy of Baron and Kenny's (1986) mediation test method (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002; Preacher & Hayes, 2004; Zhao et al., 2010). They have argued that it is not necessary to find a significant zero-order effect of X on Y to establish mediation (MacKinnon et al., 2002; Preacher & Hayes, 2004; Zhao et al., 2010), as there may be two parallel mediating variables that have opposite effects on the dependent variable. In this case, the effect of an independent variable on the dependent variable cannot be observed. Therefore, this study follows Zhao et al. (2010) and uses a bootstrap method to test the mediation effect of social network fatigue. Preacher and Hayes (2004) also recommended using a bootstrap method to test the mediation effect. The results of the bootstrap analysis in SPSS are given in Table 7.

As shown in Table 7, for the link IIR→SNF→IAB, the indirect path  $a \times b$  is nonsignificant (95 % CI [0.00, 0.10]), as the CI interval contains zero, indicating that social network fatigue does not mediate the relationship between information irrelevance and avoidance behavior. Thus, H2b is not supported. The direct link  $c'$  is significant (95 % CI [0.38, 0.56]), indicating that information irrelevance has a direct effect on information avoidance behavior. Similarly, for the IO→SNF→IAB link, the indirect path  $a \times b$  is significant (95 % CI [0.05, 0.16]), and the direct link  $c'$  is significant (95 % CI [0.08, 0.27]), indicating that social network fatigue partially mediates the relationship between information overload and information avoidance behavior. Therefore, H3b is supported. Additionally, the indirect path  $a \times b$  (0.10) and the direct path  $c'$  (0.18) are of the same sign, signaling complementary mediation. For the link SO→SNF→IAB, the indirect path  $a \times b$  is significant (95 % CI [0.08, 0.20]), and the direct link  $c'$  is not significant (95 % CI [-0.04, 0.16]), indicating that social network fatigue fully mediates the relationship between social overload and information avoidance behavior. Therefore, H4b is not supported.

##### 4.6.2. Moderation effect test

We compare the explained variance in the models with and without the interaction effects to calculate the effect size of the moderation effects using Cohen's  $f^2$  (Cohen, 2013). The difference between the R-square values is used to assess the overall effect size of  $f^2$  for the interaction, where 0.02, 0.15, and 0.35 have been suggested to be small, moderate, and large effects, respectively. For the information avoidance behavior variable,  $\Delta R^2 = 0.041$  (from 0.221 to 0.259) and  $f^2 = 0.048$ , indicating that the moderation effect is small (Cohen, 2013). To further probe the moderation effects, we plot the relationship between social network fatigue and information avoidance behavior to explore the range between one standard deviation (s.d.) above and below the mean of users' perceived time pressure, as depicted in Fig. 3.

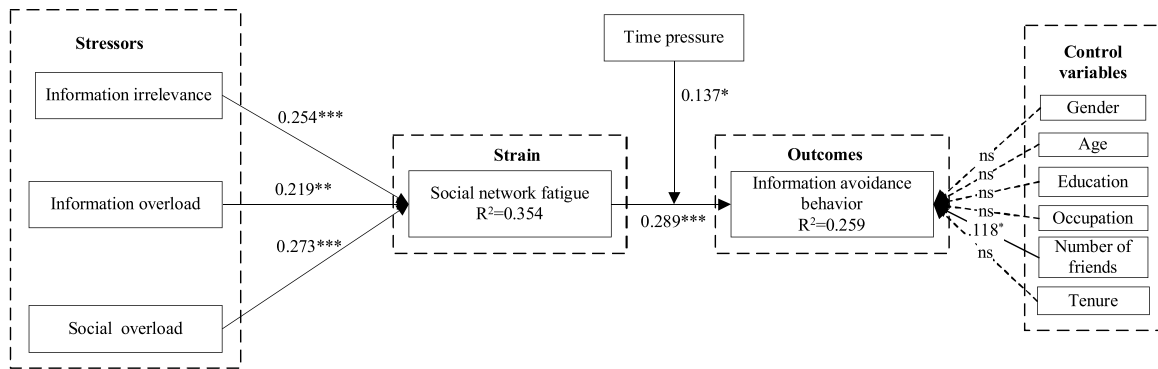


Fig. 2. SmartPLS analysis results of the research model.

Table 7  
Mediation Effect Test.

Path	Indirect effect (a × b)	Direct effect (c')	Bootstrapping Bias-Corrected 95 % CI		Mediation type observed	Results
			Lower	Upper		
IIR→SNF→IAB	0.05ns	0.46**	0.38	0.56	No mediation	H2b is not supported
IO→SNF→IAB	0.10**	0.18**	0.08	0.27	Partial mediation	H3b is supported
SO→SNF→IAB	0.13**	0.061ns	-0.04	0.16	Full mediation	H4b is not supported

Notes: \* p < 0.05; \*\* p < 0.01.

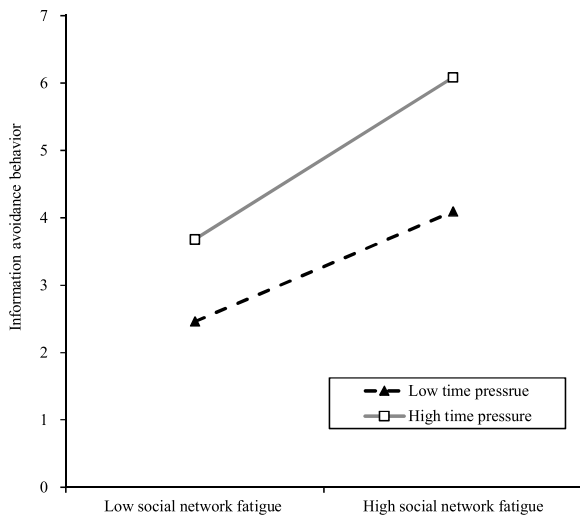


Fig. 3. Interaction of social network fatigue and time pressure.

As Fig. 3 shows, time pressure strengthens the impact of social network fatigue on information avoidance behavior. When time pressure is high, social network fatigue has a stronger positive impact on information avoidance behavior than when time pressure is low. Thus, Hypothesis 5 is supported.

5. Discussions and implications

5.1. Discussion of the findings

Drawing on the stressor-strain-outcome (SSO) framework, this study investigates how information irrelevance and SNS overload induce

social network fatigue, and how they further influence information avoidance behavior. The direct and indirect influences of information irrelevance, social overload and information overload on information avoidance behavior are examined, as is social network fatigue’s role as a mediator. The moderating effect of time pressure on the relationship between social network fatigue and avoidance behavior is also examined.

The results support five of seven hypotheses and lead to insightful findings. First, this study presents new findings on the impact of information irrelevance on avoidance behavior. As expected, the results indicate that information irrelevance directly influences avoidance behavior. This finding is consistent with prior advertising literature which has verified that advertising relevance is positively related to consumer’s continuous use intentions of personalized advertising (Bang, Kim, & Choi, 2018; Zhu & Chang, 2016). This is also in line with previous research on the IS success model, which finds that information quality is a determinant of information system usage behavior (DeLone & McLean, 1992; DeLone & McLean, 2003). Contrary to our expectations, social network fatigue does not mediate the relationship between information irrelevance and information avoidance behavior. The reason may be that when users browse irrelevant and uninteresting information, they are more likely to directly ignore or skip the information or directly avoid the friends who frequently post irrelevant posts.

As expected, we find that social network fatigue mediates the relationship between SNS overloads (social overload and information overload) and information avoidance behavior. These findings are consistent with previous studies, suggesting that perceived overload is positively related to social network fatigue (Chen & Wei, 2019; Maier, Laumer, Eckhardt et al., 2015; Maier, Laumer, Weinert et al., 2015; Zhang et al., 2016; Zhou, Li, & Jin, 2018), and social network fatigue is positively related to discontinuous intentions (Zhang et al., 2016; Zhou et al., 2018). Contrary to our expectations, social overload does not directly influence information avoidance behavior, perhaps because frequent social interactions such as “thumbs up,” “voting,” “forwarding,” etc. occur when there are relatively close relationships between users. Although it takes a lot of time and effort to maintain relationships in a social network, users usually do not directly shy away from interaction with friends. Therefore, social overload does not directly lead to information avoidance behavior, but too much social overload induces SNSs fatigue, which then leads to information avoidance. As expected, information overload is directly related to information avoidance behavior, as a large amount of information makes it difficult for users to find important messages and thus induces avoidance behavior.

As expected, time pressure significantly strengthens the relationship between social network fatigue and information avoidance behavior. As shown in Fig. 3, the impact of social network fatigue on information avoidance behavior is stronger when time pressure is high. This finding is in line with time allocation theory (Rojas-Mendez & Davies, 2005), as



avoidance behavior is an example of time allocation decision. Specifically, when users have less time, they allocate less time to social networks. Such users are more likely to engage in avoidance behavior when they experience SNSs fatigue. This finding may also be consistent with previous studies (Kawaguchi, Uetake, & Watanabe, 2019; Lin & Chen, 2013), which suggest that time pressure is generally considered as a situational variable affecting the decision making of consumers.

### 5.2. Theoretical implications

This study has several implications. First, it expands the understanding of the definition and antecedents of information avoidance behavior in SNSs. Previous studies of the passive use of SNSs have simply referred to it as discontinuous intention, which is conceptualized as the opposite of continuous use (Cao & Sun, 2018; Chen et al., 2019; Zhang et al., 2016; Zhou et al., 2018). This study responds to the call by Zhang et al. (2016), suggesting that an in-depth investigation is needed to understand actual discontinuous behavior. Thus, this study is an extension of previous studies that just focus on passive use or discontinuous intentions (Cao & Sun, 2018; Chen et al., 2019; Maier, Laumer, Eckhardt et al., 2015; Maier, Laumer, Weinert et al., 2015; Zhang et al., 2016; Zhou et al., 2018; Zhu & Bao, 2018), by more deeply investigating the specific behaviors of SNS users' information avoidance and the factors leading to it, which has mostly been ignored. A research model was proposed to analyze users' information avoidance behavior from the perspectives of information irrelevance, social overload, information overload, and SNS fatigue. Besides, the moderating role of time pressure was also examined. The findings offer a theoretical framework that may benefit future studies of SNSs use and encourage researchers to further develop and test constructs related to information avoidance behavior.

Second, our results reveal the important role of information irrelevance in promoting information avoidance behavior in SNSs use. Although prior studies have identified some factors contributing to discontinuous intention, such as fatigue and overload (Cao & Sun, 2018; Chen et al., 2019; Ravindran et al., 2014; Zhang et al., 2016; Zhou et al., 2018), the impact of information irrelevance has not been previously studied. This study contributes to prior research by showing that information irrelevance can directly induce information avoidance behavior. This finding may encourage future studies of SNSs use to pay attention to the role of information quality, especially information relevance or irrelevance. In addition, although social overload and information overload have been found to potentially induce SNSs fatigue and discontinuous intention (Chen et al., 2019; Luqman et al., 2017; Zhang et al., 2016), our study confirms and extends prior research by showing that both social overload and information overload can also lead to information avoidance behavior in SNSs use. Our findings may also provide researchers with insight into factors (e.g., information irrelevance, social overload, and information overload) which are likely to trigger some other specific behaviors of passive SNS use.

Third, this study expands our understanding of social network fatigue in SNSs use. To the best of our knowledge, no research to date has demonstrated the effect of SNS fatigue on information avoidance behavior, not to speak of its mediating role in relationships between some variables and information avoidance behavior. Although previous studies have examined the impact of perceived overload on social network fatigue (Chen & Wei, 2019; Zhang et al., 2016; Zhou et al., 2018), and the impact of social network fatigue on discontinuous intentions (Cao & Sun, 2018; Luqman et al., 2017; Zhang et al., 2016; Zhou et al., 2018; Zhu & Bao, 2018), the specifically mediating role of social network fatigue is still unknown. This study shows that social network fatigue fully mediates the impact of social overload on information avoidance behavior and partially mediates the impact of information overload on information avoidance behavior. These results will help future researchers explore how users' avoidance behavior happens from a more comprehensive perspective.

Finally, this study introduces the concept of time pressure to the study of SNS use, showing that time pressure significantly strengthens the relationship between SNSs fatigue and information avoidance behavior. Although the literature has reached an agreement that social network fatigue would lead to discontinuous intentions in SNS use (Cao & Sun, 2018; Zhang et al., 2016), no studies recognizes the specific time pressure factor that moderates the relationship between SNS fatigue and SNS usage behavior. Our study confirms and extends prior research by showing that when time pressure is high, social network fatigue has a stronger positive impact on information avoidance behavior than when time pressure is low. In doing so, this study provides a more comprehensive and precise view of the mechanisms underlying information avoidance behavior in SNSs usage. This finding may provide SNS use researchers with insights into users' time pressure, which are likely to influence some other specific behaviors of passive SNS use.

### 5.3. Practical implications

From a practical perspective, our findings also provide some guidelines for SNS users, marketers, and SNS managers.

First, this study identifies a pattern in SNS usage: after being initially attracted to an SNS, users will face social network fatigue, leading to passive behaviors, such as information avoidance. Although previous studies have investigated SNS discontinuous behaviors (Zhang et al., 2016), it is not easy for users to stop using a SNS and in fact more and more users are exhibiting information avoidance behaviors on SNSs. SNS managers should pay great attention to users' avoidance behavior, and try their best to retain users, because information avoidance behavior is a precursor of final abandonment or switching to another SNS.

Second, the results show that perceived social overload and information overload may lead to users' SNS fatigue and avoidance behavior. Thus, SNS users should understand that moderation in social network use must be taken into consideration. Since recently social media marketing has branched out of social media to become highly favored platform for marketing purposes (Dwivedi, Kapoor, & Chen, 2015). Thus, marketers should realize that frequent advertising on SNSs may produce problems such as information overload, finally resulting in customers' SNS fatigue and avoidance behavior. Too much advertising is not beneficial for advertising spreads, but may lead to the loss of customers. Thus, marketers should control the frequency and volume of advertising on SNSs. For SNS managers, they should offer better SNS management or filtering tools to reduce the complexity of social networks and help users manage information and social relationships. It is necessary to maintain existing "group management" functions to manage the social relationships for different groups in SNSs. Given the strong effect of SNS fatigue, we suggest that SNS providers prevent users' fatigue and negative emotions by providing filter mechanisms, such as allowing users to establish a limit on the amount of information and the number of social requests and friends. Alternatively, SNS providers can provide functions to rank the friends in importance, which help users filter the messages of friends efficiently and reduce the sense of fatigue.

Third, this study indicates that information irrelevance directly leads to users' avoidance behavior. Considering that "content is king" in social media (Chen & Wei, 2019), marketers should more actively concentrate on producing relevant content on such sites (Akar & Topcu, 2011; Dwivedi et al., 2015). For example, service marketers should add more interesting, surprising, and useful content to SNSs to improve perceived information relevance based on customers' interests and concerns. For SNS managers, it is necessary to maintain existing reporting functions, so that users can give feedback on information quality. SNS management should also adopt automatic identification. For example, disclosure or distribution of messages with certain phrases such as "You are not Chinese, if you do not forward this message" or "must forward" could be prohibited. In addition, SNS providers could design content management functions such as summaries of posts or

categories of content based on different users' interests. Finally, it is important for SNS providers to design the affordances in the post-adoption stage, such as frequent renewal of the interesting content, and being aware of users' needs, interests, and subculture.

Finally, the moderating effect of time pressure explains why some users are more likely to neglect information and only passively use SNSs. SNS providers should consider users' needs and expectations. Planning services based on users' responses may lead to their continued engagement with the social network. For example, providers should ask about the needs and time allocation of individuals when they join the social network. For users with limited time, providers can offer simplified versions of the service, which eliminate unnecessary and seldom used features.

## 6. Conclusions and limitations

Drawing on the stressor-strain-outcome framework, we develop a research model to examine the influence of information irrelevance, social overload and information overload on social network fatigue, and further examine how they induce information avoidance behavior. The results indicate that overload (i.e., social overload and information overload) and information irrelevance directly or indirectly lead to information avoidance behavior. Additionally, time pressure positively strengthens the relationship between social network fatigue and information avoidance behavior.

This study has several limitations, which can be addressed in future studies. First, the survey sample mainly consists of college students under 30 years old. Although the college student sample comprises the largest portion of social media users (CNNIC, 2019; Gan, 2017), it would be better for future research to include a broader range of ages to enhance the robustness of our conclusions. Second, in our model, only one dimension of information quality, information irrelevance, is considered the critical factor that leads to information avoidance behavior. Future studies could explore the effect of other dimensions of

information quality, such as information accuracy and information completeness (Delone & McLean, 2003; McKinney et al., 2002; Wang & Strong, 1996), on information avoidance behavior. Third, future studies can add personality traits, such as introversion/extroversion, as contingency factors in the research model, in order to examine their moderating effects on the influence of overloads and information irrelevance. Finally, this study collects data from WeChat Moment users in China. Given the Chinese society, characterized by high collectivism, high power distance, and Guanxi culture, may put extra pressures on SNS users (Lee et al., 2016; Shao & Pan, 2019; Zhao, Huo, Flynn, & Yeung, 2008). For example, while the Chinese require use SNSs to build Guanxi network for social support (Shao & Pan, 2019), they may feel more pressures due to the social norm of reciprocity that requires them to response to messages on time and put more efforts to maintain Guanxi network of SNSs. Thus, future studies of users from other countries are needed to obtain more reliable statistical analysis results.

## CRedit authorship contribution statement

**Yuanyuan Guo:** Conceptualization, Methodology, Writing - original draft, Supervision. **Zhenzhen Lu:** Software, Formal analysis, Investigation, Data curation. **Haibo Kuang:** Validation, Resources, Visualization, Funding acquisition. **Chaoyou Wang:** Conceptualization, Methodology, Writing - review & editing, Supervision, Project administration, Funding acquisition.

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## Appendix A

**Table A1**  
Constructs and Associated Items.

Constructs	Items	Source
Social overload	I care too much about my friends' well-being on WeChat Moments.	Zhang et al. (2016); Maier, Laumer, Eckhardt et al. (2015)
	I pay too much attention to interactions with my friends on WeChat Moments.	
	I deal too much with my friends' problems on WeChat Moments	
Information overload	I care too much about my friends' posts on WeChat Moments.	Zhang et al. (2016)
	There is too much information about my friends on WeChat, so I find it a burden to handle.	
	I find it hard to extract important information from the excessive amount of information available to me on WeChat Moments.	
Information irrelevance	I find it hard to get the information that is relevant to my needs from the excessive amount of information available to me on WeChat Moments.	Lee et al. (2016)
	Information in WeChat Moments is useless to me.	
	Information in WeChat Moments is not applicable to me.	
Social network fatigue	Information in WeChat Moments is not related to my interests.	Zhang et al. (2016)
	Sometimes I get bored when using WeChat Moments.	
	Sometimes I get worn out from using WeChat Moments.	
Time pressure	I feel disinterested in whether there are new things happening on WeChat Moments.	Dapkus (1985)
	I feel indifferent about the reminders or alerts about new things on WeChat Moments.	
	I feel rushed to do the things that I have to complete.	
Information avoidance behavior	I do not have enough time to get everything done.	Cho (2004); Shin and Lin (2016)
	I often feel pressed for time.	
	I intentionally ignore some posts on WeChat Moments.	
	I intentionally don't pay attention to some posts on WeChat Moments.	
	I scroll down Web pages to avoid some posts on WeChat Moments.	
	I use technical means to avoid some posts on WeChat Moments.	

**Table A2**  
Analysis of Non-response Bias.

	The first 25 percent responses (n = 85)	The final 25 percent responses (n = 85)	Significance (p-value)	Usable responses (n = 341)	Eliminated responses (n = 38)	Significance (p-value)
SO	3.25	3.41	0.29	3.15	2.83	0.30
IO	3.74	3.89	0.38	3.71	3.31	0.26
IIR	4.41	4.52	0.52	4.42	3.82	0.15
SNF	3.68	3.88	0.17	3.47	3.11	0.28
IAB	4.67	4.60	0.62	4.35	4.21	0.69
TP	4.27	4.08	0.20	4.23	3.89	0.36

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