Why Discontinue Facebook Usage?
An Empirical Investigation Based on a Push-Pull-Mooring Framework

Shaoxiong Fu
College of Information Management, Nanjing Agricultural University, Nanjing, China
Hongxiu Li
Department of Information and Knowledge Management, Tampere University, Tampere, Finland, and
Yong Liu
School of Business, Aalto University, Espoo, Finland

Abstract

Purpose - Social media platforms are currently facing the challenge of declining user activity. Building on the push–pull–mooring (PPM) framework, the current study developed a research model to evaluate factors that affect Facebook discontinuance.

Design/methodology - The proposed research model assessed how push factors (e.g., Facebook fatigue and dissatisfaction), a pull factor (e.g., alternative attractiveness), and mooring factors (e.g., personal norms and habit of using Facebook) affected the discontinued usage behavior regarding Facebook. The proposed research model was validated using empirical data (n = 412) collected from Facebook users.

Findings - Facebook fatigue, dissatisfaction, and alternative attractiveness significantly and positively affected discontinued Facebook usage. Personal norms and habit of using Facebook had a converse influence in this regard. Dissatisfaction had a stronger positive impact than Facebook fatigue and alternative attractiveness on the discontinued usage behavior regarding Facebook. Habits of using Facebook had a greater negative effect than personal norms of using Facebook on the discontinued usage behavior regarding Facebook by users.

Originality/value - Our study extends extant literature on social media discontinuance to identify the antecedents of discontinuous usage behavior in social media. This study enriches the literature on social media discontinuance by shedding light on the different degrees of effect of the push, pull, and mooring factors on discontinuous social media usage behavior.

Keywords Social media discontinuance, Push-pull-mooring framework, Social media fatigue, Dissatisfaction, Alternative attractiveness, Personal norm, Habit

Paper type Research paper

1. Introduction

Social media is widely regarded as an integral part of the daily lives of individual users (Maier *et al.*, 2015a). During the coronavirus disease 2019 (COVID-19) pandemic, some users substantially increased their social media usage for communication, information searching and sharing, and some users reduced or ceased their utilization of social media owing to information overload (Soroya *et al.,* 2021) and frustration with the spread of fake news and misinformation on social media (Apuke and Omar, 2021; Cinelli *et al.,* 2020). Thus, to retain social media users, social media providers need to understand the factors promoting as well as mitigating social media discontinuance.

To this end, information systems (IS) scholars have attempted to explain social media discontinuation in recent years, including social media discontinuance intentions, social media discontinuance behavior, controlled or reduced social media usage (Maier *et al.*, 2015b; Turel, 2015; Tang, Chen, and Gillenson, 2019). In the current study, social media discontinuance refers to individual users' decisions to suspend or quit using social media (Parthasarathy and Bhattacherjee, 1998). It involves a user's complete withdrawal from a social media platform or the suspension of social media usage for a limited period. Previous research has explored decisions to discontinue social media using different theories, including the stimulus–organism–response paradigm (Luqman *et al.*, 2017), social support theory (Maier *et al.*, 2015a), and stress-coping theory (Chen, Tran, and Nguyen, 2019).

Prior research has shown that social media discontinuance is impacted by different factors, such as push effects (e.g., dissatisfaction, regret, and perceived risk) (Fu, 2011; Fang and Tang, 2017; Handarkho and Harjoseputro, 2020) and pull effects (e.g., peer pressure, alternative attraction, and word of mouth) (Hwang, Shim, and Park, 2019; Singh and Rosengren, 2020). Certain factors, such as switching costs, habit, subjective norms, and learning engagement, have been shown to either promote or mitigate social media discontinuance, thereby exerting a mooring effect on social media discontinuance (Li *et al.*, 2018; Chen and Keng, 2019; Singh and Rosengren, 2020). Though prior research has investigated IS discontinuance from the push-pull-mooring view, but few studies have explained social media discontinuance from the integrated view of push, pull, and mooring effects.

The current study used the push-pull-mooring (PPM) framework to develop a model to identify the antecedents of discontinuous usage behavior in a social media context. Specifically, push factors refer to the negative perceptions and experiences of social media users that lead to their discontinuous social media use (Sun *et al.*, 2017; Chen and Keng, 2019; Tang and Chen, 2020). Social media fatigue and dissatisfaction reflect negative feelings and emotions that users have experienced while using social media (Sun *et al.*, 2017; Zhang and Von Dran, 2000), which could generate push effects on users' discontinuous social media use. Thus, social media fatigue and dissatisfaction are defined as pushing factors in terms of social media discontinuance.

Pull factors refer to the drivers that draw users to give up the social media they currently use (Sun *et al.*, 2017; Chen and Keng, 2019; Tang and Chen, 2020). Alternative attractiveness reflects the appeal of other social media to prospective users (Tang and Chen, 2020). Although alternative attractiveness has been identified in the literature as a pull factor, the attention of most academics has focused on the impact of users' switching intentions rather than the factors

that impact IS discontinuation. Thus, alternative attractiveness is regarded as a pull factor for users to suspend or stop using a specific social media.

Mooring factors refer to individual, social, and environmental characteristics that promote or mitigate users' discontinuous usage behavior pertaining to social media (Sun *et al.*, 2017; Chen and Keng, 2019; Tang and Chen, 2020). Personal norms and habit of using social media are defined as the inclination of users to maintain their original social relationships and social media usage patterns (Turel, 2015; Yazdanmehr and Wang, 2016). The findings of prior research on the impacts of personal norms and habit of using social media on IS usage have been inconsistent, with these factors demonstrated to either promote or assuage IS use. Thus, in the current study, both personal norms and habit of using social media were considered mooring factors in relation to social media discontinuance.

The remainder of the paper is organized as follows: A literature review was performed of previous research on social media discontinuance. Then, the PPM framework is described as the main theoretical framework used to study the termination of social media usage in the current study. Thereafter, this paper elucidates the research model and hypotheses, and it provides a description of the research methodology. The paper concludes with a discussion of the findings, along with the related theoretical and managerial implications.

2. Literature review

2.1 Social media discontinuance

In the past decade, social media discontinuance has gradually attracted the attention of IS scholars, and various theories have been applied to explain the antecedents of social media discontinuance. For instance, Luqman *et al.* (2017) employed the stimulus–organism–response paradigm to identify the positive impacts of excessive social, cognitive, and hedonic aspects of social media use (i.e., stimuli) on technological stress and social media exhaustion (i.e., organisms), which, in turn, exert positive effects on discontinuous usage intentions. Maier *et al.* (2015a) applied the social support theory to verify how user characteristics, usage characteristics, and the characteristics of relationships influenced users' social overload, thereby definitively influencing their discontinuous usage intentions regarding social media. In addition to the above theories, the technology acceptance model (Tang, Chen, and Gillenson, 2019), expectation confirmation theory (Tang, Chen, and Gillenson, 2019) and stress-coping theory (Chen, Tran, and Nguyen, 2019) have also been used to analyze the factors that contribute to social media discontinuance. Through empirical research on 510 Facebook users, Turel (2015) indicated that self-efficacy and feelings of guilt facilitate social media discontinuous usage intentions, while satisfaction can directly and indirectly decrease discontinuous usage intentions via habit development. Based on mixed methods—combining a qualitative in-depth interview with a quantitative analysis of user activities—Ravindran, Yeow Kuan, and Hoe Lian (2014) found that negative emotions and reduced needs can lead to short breaks in social network activities, controlled social network activities, and suspended social network activities.

Social media discontinuance has also been discussed in the context of COVID-19. For instance, by employing the stimulus–organism–response paradigm, Soroya *et al.* (2021) found that overexposure to information on social media, directly or indirectly, resulted in information anxiety in users, leading to information avoidance on social media, which is highly related to

social media discontinuance. Laato *et al.* (2020) indicated that information overload in social media use affected unverified information sharing on social media, which positively associates with social media discontinuance.

These theories explain social media discontinuance based on users' different perceptions and experience in their social media use; however, a distinction has not previously been made between PPM factors to explain how PPM factors explain social media discontinuous usage behavior.

2.2 The push–pull–mooring framework

The PPM framework, first applied in the literature on migration (Lee, 1966; Moon, 1995), has been used to explicitly identify the different impacts of PPM factors on IS users' behavioral responses. Specifically, push factors are elements that drive individuals from an original place, such as originally used social media. Pull factors attract potential migrants to a particular position. Mooring factors refer to the additional factors promoting or assuaging decision-making for individual, social, or environmental reasons (Moon, 1995).

The PPM framework has been extensively applied in the literature to evaluate switching intentions (Xu *et al.*, 2014; Sun *et al.*, 2017; Hwang, Shim, and Park, 2019; Singh and Rosengren, 2020). In a study on 250 online grocery shoppers, push (problems with delivered products, high price perception, technical problems, and customer service) and pull factors (alternative attraction and word of mouth) were shown to directly influence shoppers' switching intentions, while mooring factors (previous switching behavior and switching costs) moderated switching intentions (Singh and Rosengren, 2020). Based on a questionnaire survey of 301 English learning platform users, Chen and Keng (2019) determined that push factors (service quality, learning convenience, and perceived price), pull factors (perceived usefulness and e-learning motivation) and mooring factors (switching costs, learning engagement, and social presence) influenced users' intentions to switch from offline to online platforms. In the context of social media, Xu *et al.* (2014) identified dissatisfaction with information quality, technical quality, socialization support, entertainment value, and member policy as push factors, attraction from the alternative social media as a pull factor, and switching costs and peer influence as mooring factors. Hwang, Shim, and Park (2019) defined social media interaction overload and concerns about unwanted relationships and privacy as push factors, alternative attraction and peer pressure as pull factors and switching costs as a mooring factor. In an e-commerce context, Susanty, Handoko, and Puspitasari (2020) established that push factors (support for information-searching behaviors and the perceived value of e-commerce) positively affected the intentions of users to switch from adopting traditional marketing to e-commerce.

A summary of prior studies on the application of the PPM framework is provided in Table I. As shown in Table I, the PPM framework has been previously used to explain IS discontinuance in different contexts in relation to switching intentions. There is limited knowledge of the use of the PPM framework to explain social media discontinuance behavior. Thus, the current study employed PPM framework as a theoretical base to examine the separate and combined influences of PPM factors on users' social media discontinuous usage behavior.

Authors	Contexts	Push factors	Pull factors	Mooring factors	Outcomes
Fu, 2011	Career commitment of IT professionals	- Career satisfaction - Treat of professional obsolescence	Availability of career alternatives	- Professional self-efficacy - Career investment	Career commitment
Xu et al., 2014	Social media	Dissatisfaction with the current social media	Attraction from the alternative social media	- Switching costs - Peer influence	Switching intention
Fang, and Tang, 2017	Instant messaging	Regret	- Network effects - Similarity - Innovation	Switching costs	Migrate Intention
Li et al., 2018	Omnichannel retailing	Retailer uncertainty	Identity attractiveness	Switching costs	- Customer Retention - Interest in alternatives
Hwang, Shim, and Park, 2019	Social media	- Interaction overload - Concerns about unwanted relationships - Concerns about privacy	- Alternative attraction - Peer pressure	Switching cost	Switching intention
Chen, and Keng, 2019	Offline-Online learning	- Learning convenience - Service quality - Perceived price	- E-learning motivation - Perceived usefulness	- Learning engagement - Switching costs - Social presences	Switching intention
Handarkho, and Harjoseputro, 2020	Mobile payment in physical stores	Perceived risk	- Enjoyment - Convenience - Deal proneness	- Consumer innovativeness - Subjective norms - Perceived herd behavior	Intention to adopt mobile payment
Tang, and Chen, 2020	Brand microblogs	- Dissatisfaction with information quality - Dissatisfaction with service quality - Person-brand “unfit”	Alternative attractiveness	Perceived unfollowing costs	Unfollowing motivations

Singh, and Rosengren, 2020	Online grocery	- Customer service - Delivered products - Price perception - Technical issues	- Word of mouth - Alternative attraction	- Switching cost - Past switching	Switching intention
Susanty, Handoko, and Puspitasari, 2020	E-commerce	- Support for information searching - Value of e-commerce for a business	Attractiveness of e-commerce adoption	Self-efficacy small- and medium-size enterprises	Switching from offline retail store to e-commerce

Table I. A summary of prior studies applying the push-pull-mooring framework

3. Hypotheses formulation and research model development

The research model used in the current study was developed based on the PPM framework. Specifically, social media fatigue and dissatisfaction were perceived to be push factors; alternative attractiveness was regarded as a pull factor; and personal norms and habit of using social media were considered mooring factors. These push, pull and mooring factors will affect social media discontinuous usage behavior.

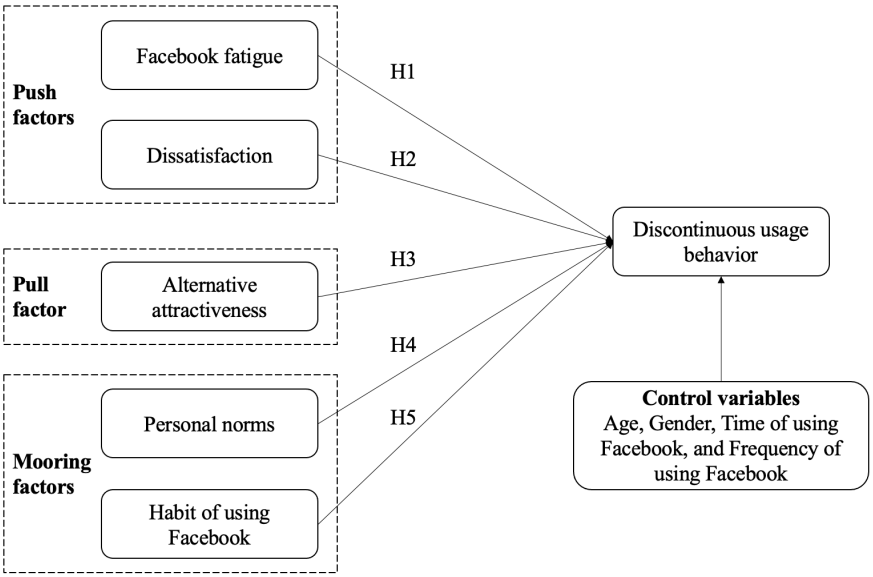


Figure 1. Research model

Specifically, social media fatigue depicts the feelings of tiredness due to social media use, which has been largely applied to explain the suspending and withdrawing from social media (Ravindran, Yeow Kuan, and Hoe Lian, 2014). Dissatisfaction is regarded as the subjective negative attitudes of users toward social media use, based on past experiences, and it reflects an emotional and utilitarian assessment of social media use. Dissatisfaction has been identified as one of the main reasons for intentions to discontinue using social media (Peng, Zhao, and Zhu, 2014). Thus, social media fatigue and dissatisfaction are considered to be push factors for social media discontinuance (Xu *et al.*, 2014; Sun *et al.*, 2017).

In addition, alternative attractiveness has been shown to enhance users' intentions to suspend or stop using an IS; however, it has also been identified as a pull factor and has been associated with users' switching behaviors in the social media context (Xu *et al.*, 2014; Hwang,

Shim, and Park, 2019). Thus, alternative attractiveness was selected as the pull factor for social media discontinuance in the current study.

Personal norms refer to the internalized norms of users derived from their values (Yazdanmehr and Wang, 2016). Habit is the inherent behavioral pattern of users that develops over time. Both personal norms and habit of using social media have been demonstrated to promote or reduce IS discontinuance behavior (Soror *et al.*, 2015; Schwartz, 1977). When personal norms and habit align or conflict with users' subjective behavioral attitudes toward IS discontinuance, they respectively enhance or weaken behavioral attitudes. Thus, both personal norms and habit of using social media were selected as mooring factors for social media discontinuance in the current study. The potential impacts of demographic features, age, gender, the time of using social media, and frequency of social media use were evaluated and incorporated in the model as control variables.

3.1 Push factors

According to the tenets of the PPM framework, users' negative feelings equate to push factors (Xu *et al.*, 2014; Sun *et al.*, 2017). Social media fatigue has been defined as a user's self-evaluated and subjective negative feelings (e.g., exhaustion, tiredness, and feeling overwhelmed) toward social media usage (Sun *et al.*, 2017). Social media fatigue reflects the inclination of users to abstain from social media usage after overexposure thereto (i.e., information, system features, and social overload) (Dhir *et al*., 2018). When the social media fatigue of users exceeds their endurance threshold, they may reduce or even suspend their social media use (Ravindran, Yeow Kuan, and Hoe Lian, 2014). Meanwhile, recent studies on social media have revealed social media fatigue acts as an antecedent of a decline in users' social media usage (Shokouhyar *et al.*, 2018) and their intentions to discontinue using social media (Zhang *et al*., 2016). Thus, we propose the following:

H1. Facebook fatigue is positively associated with discontinuous usage behavior regarding Facebook.

In terms of the expectancy disconfirmation theory (Bhattacherjee, 2001), when a user's experience of social media meets his or her expectations, satisfaction with social media results. Conversely, user dissatisfaction is expressed through negative emotions, such as disappointment, displeasure, and bitterness (Zhang and Von Dran, 2000). Negative emotions contribute to discontinuous usage behavior (Zhang *et al.*, 2016). Meanwhile, compared to satisfied users, dissatisfied users are more inclined to terminate the service (Loveman, 1998). It is widely accepted that dissatisfaction causes a deterioration in the user's mental state, which, in turn, leads to the suspension of social media and making a switch to other social media in pursuit of a better experience (Yao, Phang, and Ling, 2015). Prior research has also established a positive correlation between dissatisfaction and discontinuous usage intentions (Peng, Zhao, and Zhu, 2014). Thus, the following hypothesis was proposed:

H2. Dissatisfaction is positively associated with discontinuous usage behavior regarding Facebook.

3.2 Pull factor

According to the PPM framework, alternative attractiveness is a push factor that engenders the post-adoption behavior of users (Tang and Chen, 2020). Alternative attractiveness refers to positive user perceptions of competitive suitable alternatives that are available in the social media market (Jones, Mothersbaugh, and Beatty, 2000). The existing literature offers robust

evidence of the positive influence of alternative attractiveness on users' intentions to change to other social media platforms (Kim, Shin, and Lee, 2006; Tang and Chen, 2020). When users perceive that the alternative is either not better than or is the same as the social media initially used, they are likely to continue using the current social media choice (Tang and Chen, 2020). When a better or more competitive social media option becomes available, users may suspend or abandon using the current social media platform (Patterson and Smith, 2003). Thus, the following hypothesis was proposed:

H3. Alternative attractiveness is positively associated with discontinuous usage behavior regarding Facebook.

3.3 Mooring factors

Personal norms constitute a subjective sense of moral obligation to participate in a particular behavior (Schwartz, 1977). According to the norm activation theory, personal norms act as a clear signal of user behavior (Schwartz, 1977). In the social media context, personal norms reflect users' moral obligation to share information with friends using their current favored social media (Yazdanmehr and Wang, 2016). Compliance with personal norms means that each user adheres to his or her own moral system when deciding whether to continue using social media (Osterhus, 1997). Once users form personal norms, they experience mental satisfaction in relation to the continuity of existing social media usage patterns. Thus, personal norms ensure that users regard social media use as beneficial, which means that they will continue to use it (Vandenbergh, 2005). Therefore, it follows that if social media usage corresponds with a user's personal norms, he or she is unlikely to discontinue using social media. Thus, the following hypothesis was proposed:

H4. Personal norms are negatively associated with discontinuous usage behavior regarding Facebook.

The habit of using social media can be defined as the extent to which users are inclined to use social media automatically (Soror et al., 2015) and reflects a user's dependence on social media in his or her daily life (Turel, 2015). Compared to users who are not accustomed to social media usage, individuals who have formed the habit of using social media are more dependent on social media usage; thus, they are less likely to discontinue using it (Limayem, Hirt, and Cheung, 2007). Typically, the habitual use of social media drives an individual's use of social media via inertia (Sun et al., 2017). Habit formation is regarded as an antecedent of inertial behavior (Polites and Karahanna, 2012). Inertia when using social media ensures that users attach and adhere to current social media usage patterns, even if they are unsatisfied with the social media platform and/or if better alternatives exist to which they could change (Polites and Karahanna, 2012). The habit of using social media embodies users' tendency to regularly communicate with friends via social media (Turel, 2015). Individuals who are in the habit of using social media prefer to maintain current social media usage patterns rather than reduce or abandon the use of social media. Moreover, in research on individual habits, Chen and Keng (2019) observed that users' habits negatively impacted their intentions to discontinue using a service. Once habit formation was established, the individual might forgo choosing alternative services owing to a lack of familiarity with the new service (Chen and Keng, 2019). Thus, the following hypothesis was proposed:

H5. The habit of using Facebook is negatively associated with discontinuous usage behavior regarding Facebook.

4. Research Methodology

4.1 Construct measurement

The current study used a field survey for the data collection. The measurement items for the constructs in the proposed research model were adapted from those detailed in the existing literature to fit the Facebook context. The methods used to measure social media fatigue and dissatisfaction were respectively obtained from the studies of Maier *et al.* (2015a) and Chang *et al.* (2014). The constructs used to assess alternative attractiveness, person norms, and habit of using social media were respectively adapted from the research by Jones *et al.* (2000), Polites *et al.* (2018), and Limayem *et al.* (2007). The construct delineating discontinuous usage behavior is measured with items taken from the work of Maier *et al.* (2015b) and Shen, Li and Sun (2018). Each construct item was measured using a seven-point Likert scale, ranging from "strongly disagree" (1) to "strongly agree" (7).

4.2 Sample and data collection

The study was conducted in Finland using an English questionnaire. To determine the validity and reliability of the proposed research, a pilot test of the questionnaire was conducted on 15 doctoral candidates in Finnish universities with experience of using Facebook. Thereafter, an online survey was conducted through Amazon's Mechanical Turk (MTurk), an online crowdsourcing platform. MTurk is a new and innovative way of recruiting research participants, and it has been widely adopted in various research fields, including IS, accounting, marketing, and psychology (Lozano and Fraley, 2021; Ried *et al.,* 2020; Maier *et al.,* 2019).

A specification was that only those who have used Facebook before could participate in the research, and each respondent can only complete the online questionnaire once. Since high compensation to participants for taking part in the study does not guarantee data quality, and low compensation would have inevitably prolonged the data collection period, a decision was made to offer moderate compensation ($0.20 per respondent) to those who responded to the online survey.

On the front page of the survey questionnaire, the participants were apprised of the importance of the study and were required to provide informed consent before proceeding to the questionnaire. The respondents had the right to withdraw from participation in the online questionnaire at any time. They were asked to evaluate their past Facebook use and to consider their experiences of using Facebook. 489 responses were collected in a week. 77 responses were eliminated owing to unreliability (i.e., failure in going through the attention check questions in the questionnaire or rushed completion of the survey), and 412 participants were retained as the valid sample for the data analysis. Previous research has determined that an adequate sample size is 5–10 subjects per measurement item, up to a total of 300 respondents (Kass and Tinsley, 1979; Tinsley and Tinsley, 1987). This research utilized 20 measurement items. Meanwhile, previous research on (dis)continuance (e.g., Cao and Sun, 2018; Gan and Li, 2018; Luqman *et al.,* 2017) and Facebook usage (e.g., Beyens *et al.,* 2016; Malik *et al.,* 2016) utilized similar sample sizes, which ranged from 258–430. Therefore, the sample obtained can be regarded as appropriate for the current study.

The demographic breakdown of past experiences of Facebook use by the respondents (209 males, 51%; 203 females, 49%) was detailed in Table II. According to the distribution of Facebook users worldwide in 2021, the male users account for 43.2% and female users account for 56.8% of Facebook users (Statista, 2021). The distribution of gender in the sample in this

study is close to the sample distribution though there is slightly difference (49.3% for male and 50.7 for female users). In addition, according to the Statista (2021) report, most of the Facebook users are between 18 to 54 years old. In this study, 89.8% of the research participants are 19-54 years old. Thus, the sample in this study can present the general Facebook users. Meanwhile, most respondents had used two social network sites (n = 119, 29%), and 22 (5%) reported having used more than five social network sites before. 205 (50%) of the 412 respondents had approximately eight years of experience using Facebook. A large proportion of the participants (n = 317, 77%) had used Facebook for less than two hours per day in the past. Notably, two thirds had used Facebook several times a day in the past (n = 253; 61%).

Measurement	**Item values**	**Total count per item**	**Percentage (%)**
Gender	Male	209	50.7
	Female	203	49.3
Age	18 or less	0	0.0
	19-24	34	8.2
	25-34	184	44.7
	35-44	108	26.2
	45-54	44	10.7
	Above 54	42	10.2
Number of social media in use	1	49	11.9
	2	119	28.9
	3	109	26.5
	4	87	21.1
	5	26	6.3
	More than 5	22	5.3
Experience using Facebook	Less than 1 year	0	0.0
	1-2 years	3	0.7
	2-4 years	34	8.2
	4-6 years	81	19.7
	6-8 years	89	21.6
	More than 8 years	205	49.8
Daily Facebook-use time in the past	Less than 1 hour	140	34.0
	1-2 hours	177	43.0
	2-5 hours	76	18.4
	More than 5 hours	19	4.6
Frequency using Facebook in the past	Hourly	48	11.6
	Several times per day	253	61.4
	Once per day	63	15.3
	Several times per week	32	7.8
	Once per week	16	3.9

Table II. Demographic statistics for the sample (N = 412)

5. Data Analysis and Results

5.1 Measurement model

The structural equation modeling technique was employed to examine the research framework. SmartPLS 3.0 was utilized to examine the reliability and validity of each latent variable

measurement as well as the paths between the constructs and their significance level (Gefen, Rigdon, and Straub, 2011).

Measurement reliability delineates the stability and consistency of a tested measurement, which can be evaluated by examining its Cronbach's alpha (Cronbach's α), composite reliability (CR), and average variance extracted (AVE) (Fornell and Larcker, 1981). As shown in Table **III**, Cronbach's alpha values were above 0.9, implying acceptable reliability of the related measurements (Moss *et al.*, 1998; Hinton *et al.*, 2014). The CR values for all of the constructs were greater than 0.9, and all AVE figures were above 0.7, satisfying the suggested threshold values of 0.7 and 0.5, respectively (Fornell and Larcker, 1981; Fornell and Bookstein, 1982). The test results indicate that the related measurements have acceptable reliability. Table IV indicates that the item loadings for all construct items were above 0.7, showing that these constructs have good convergent validity.

Recommended by Barclay et al. (1995), the discriminant validity of all latent constructs was tested. Table **III** shows that the discriminant validity holds since the square root of the AVE of each construct surpassed its correlation with any other constructs. This shows that each construct possesses a more distinctive variance compared to its shared variance with other constructs (Fornell and Larcker, 1981). As shown in Table IV, all items loaded with higher respective constructs than the others, which offers additional evidence for discriminant validity. Taken together with the preceding results, our measurement model therefore expresses sufficient convergent as well as discriminant validity.

Since the questionnaires were collected in a cross-sectional survey, a common method bias (CMB) problem may exist. Harman's one-factor test, a widely applied method in evaluating CMB, was employed to test this problem (Podsakoff *et al.*, 2003). The variance explained by the first primary component was 41.51%, indicating that CMB is not a possible contaminant of the results. Moreover, the variance inflation factors (VIF) for all focal constructs in this study fell below 10, eliminating the potential multicollinearity issue (Neter *et al.*, 1996).

	Cronbach's α	**CR**	**AVE**	**FF**	**DS**	**AA**	**PN**	**HUF**	**DUB**
FF	0.96	0.97	0.89	**0.94**					
DS	0.96	0.97	0.90	0.59	**0.95**				
AA	0.93	0.95	0.87	0.24	0.30	**0.93**			
PN	0.93	0.95	0.83	-0.28	-0.47	-0.01	**0.91**		
HUF	0.92	0.95	0.87	-0.21	-0.47	-0.11	0.72	**0.93**	
DUB	0.92	0.94	0.77	0.51	0.59	0.33	-0.42	-0.42	**0.88**

Notes: Facebook fatigue, FF; Dissatisfaction, DS; Alternative attractiveness, AA; Personal norms, PN; Habit of using Facebook, HUF; Discontinuous usage behavior, DUB.

Table III. Variable reliability, correlations, and AVE

Constructs / Items	FF	DS	AA	PN	HUF	DUB
FF1	0.928	0.485	0.229	-0.224	-0.132	0.439
FF2	0.934	0.524	0.228	-0.223	-0.167	0.432
FF3	0.950	0.589	0.236	-0.315	-0.255	0.514
FF4	0.956	0.598	0.200	-0.280	-0.224	0.538
DS1	0.560	0.949	0.299	-0.418	-0.437	0.558
DS2	0.559	0.957	0.302	-0.431	-0.456	0.571
DS3	0.561	0.954	0.292	-0.447	-0.436	0.577
DS4	0.545	0.935	0.242	-0.472	-0.467	0.527
AA1	0.165	0.205	0.904	0.065	-0.043	0.260
AA2	0.223	0.261	0.953	0.020	-0.050	0.304
AA3	0.260	0.354	0.938	-0.099	-0.196	0.343
PN1	-0.249	-0.433	0.010	0.904	0.609	-0.370
PN2	-0.184	-0.366	-0.041	0.855	0.626	-0.342
PN3	-0.285	-0.472	-0.040	0.944	0.709	-0.431
PN4	-0.292	-0.412	0.026	0.930	0.648	-0.369
HUF1	-0.170	-0.423	-0.085	0.640	0.935	-0.386
HUF2	-0.233	-0.476	-0.108	0.679	0.952	-0.408
HUF3	-0.184	-0.419	-0.117	0.678	0.904	-0.368
DUB1	0.425	0.441	0.226	-0.283	-0.328	0.715
DUB2	0.458	0.508	0.284	-0.375	-0.381	0.895
DUB3	0.468	0.515	0.312	-0.386	-0.380	0.930
DUB4	0.448	0.542	0.288	-0.409	-0.391	0.930
DUB5	0.457	0.567	0.319	-0.369	-0.346	0.897

Notes: Facebook fatigue, FF; Dissatisfaction, DS; Alternative attractiveness, AA; Personal norms, PN; Habit of using Facebook, HUF; Discontinuous usage behavior, DUB

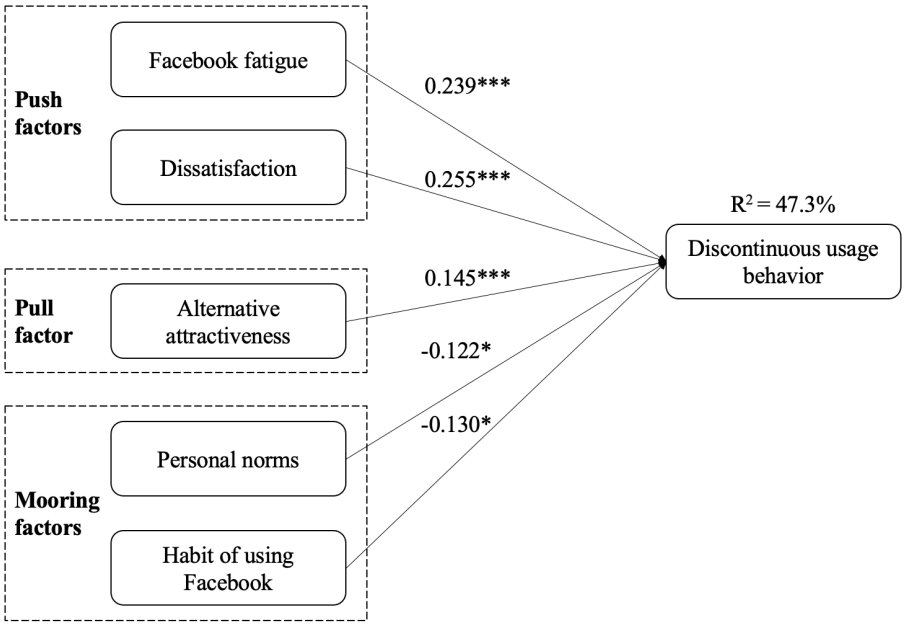
Table IV. Loading and cross-loading matrix

5.2 The structural model

Firstly, the effects of push factors on discontinuous usage behavior were examined. The results are summarized in Figure 2. In alignment with our expectations, Facebook fatigue ($\beta = 0.239$, $p < 0.001$) and dissatisfaction ($\beta = 0.255$, $p < 0.001$) significantly and positively impacted discontinuous usage behavior, which support H1 and H2. Secondly, the effects of pull factors on discontinuous usage behavior were assessed. Again, consistent with our expectations, alternative attractiveness ($\beta = 0.145$, $p < 0.010$) was shown to significantly and positively influence discontinuous usage behavior, in support of H3.

Thirdly, the researchers evaluated the effects of mooring factors on discontinuous usage behavior. As anticipated, personal norms ($\beta = -0.122$, $p < 0.001$) and habit of using Facebook ($\beta = -0.130$, $p = < 0.001$) significantly and positively affected discontinuous usage behavior, thereby corroborating H4 and H5. An R-squared value of 47.3% was reported for discontinuous usage behavior. The age of the participants ($\beta = -0.115$, $p < 0.010$), time of using Facebook ($\beta = 0.092$, $p < 0.050$), and the frequency of using Facebook ($\beta = 0.105$, $p < 0.050$) all significantly

influenced discontinuous usage behavior. However, gender (β = 0.044; n.s.) was demonstrated to insignificantly impact discontinuous usage behavior.



*(Note: *: P<.05, **: P<0.01, ***: P<0.001)*

Figure 2. Research model with results

5.3 Post-hoc analysis

To compare the effect sizes of PPM factors on discontinuous usage behavior, the path comparison method suggested by Keil *et al.* (2000) was adopted. As shown in Table V, the findings were as follows: (1) Dissatisfaction had a stronger positive impact than Facebook fatigue, and Facebook fatigue exerted a stronger positive impact than alternative attractiveness, on discontinuous usage behavior, and (2) the habit of using Facebook exerted a stronger negative impact than personal norms on discontinuous usage behavior.

Path coefficient	Results	Conclusion
$\beta_{FF\rightarrow DSB}$ vs. $\beta_{DS\rightarrow DSB}$ = 0.239*** vs. 0.255***	t=-3.894**	$\beta_{FF\rightarrow DSB} < \beta_{DS\rightarrow DSB}$
$\beta_{FF\rightarrow DSB}$ vs. $\beta_{AA\rightarrow DSB}$ = 0.239*** vs. 0.145***	t=28.602**	$\beta_{FF\rightarrow DSB} > \beta_{AA\rightarrow DSB}$
$\beta_{PN\rightarrow DSB}$ vs. $\beta_{HUF\rightarrow DSB}$ = -0.122*** vs. -0.130***	t=1.822**	$\beta_{PN\rightarrow DSB} < \beta_{HUF\rightarrow DSB}$

*Notes: Facebook fatigue, FF; Dissatisfaction, DS; Alternative attractiveness, AA; Personal norms, PN; Habit of using Facebook, HUF; Discontinuous usage behavior, DUB. **: P< 0.01*

Table V. Path comparison analysis results

6. Discussion

The current study adopted a PPM framework to evaluate the direct effects of Facebook fatigue and dissatisfaction (push factors), alternative attractiveness (a pull factor), and personal norms and habit of using Facebook (mooring factors) on discontinuous usage behavior.

In the case of push factors, as expected, fatigue and dissatisfaction with Facebook use were found to induce discontinuous usage behavior regarding Facebook. Consistent with the findings of previous studies (Ravindran, Yeow Kuan, and Hoe Lian, 2014; Shokouhyar, Siadat, and Razavi, 2018), experience of fatigue can induce users' IS discontinuance. A fatigued state

can lead not only to a user's discontinuous usage intentions, but also ultimately triggers his or her decision to quit social media platforms. For example, during the COVID-19 pandemic, the overexposure of users to information on social media and the consequent social media fatigue resulted in their social media discontinuance.

Similarly, dissatisfaction was positively linked to discontinuous usage behavior in the current study, which was in contrast to the findings of Sun *et al.* (2017); they demonstrated that dissatisfaction was not significantly influential in this regard. The difference in the findings can possibly be attributed to the extent to which alternative platforms are available in the marketplace. There were only a few available alternatives to the mobile instant messaging applications that were evaluated in China in the study by Sun *et al.* (2017), whereas there were several alternatives to Facebook (e.g., Instagram and WhatsApp) in the social media marketplace in the current study. Therefore, those who are dissatisfied with Facebook use were more motivated to give up using Facebook when they experienced negative emotions (i.e., dissatisfaction). In addition, during COVID-19, fake news, rumor and misinformation circulating on Facebook may cause user dissatisfaction with Facebook, leading to their discontinuance of Facebook.

For pull factor, alternative attractiveness was found to induce discontinuous usage behavior regarding Facebook. This finding is consistent with the findings of the study by Tang and Chen (2020) and Hwang, Shim, and Park (2019); however, it is inconsistent with the finding by Sun *et al.* (2017) for the reasons already suggested. Specifically, attractive alternatives will diminish the cost for users' abandoning of Facebook. Users may even get a better user experience from alternatives. In addition, users tend to pursue better services (Shi *et al.*, 2018). When users feel that social media other than Facebook can better meet their needs and provide a better user experience, they are more likely to quit Facebook and switch to other social media.

For mooring factors, personal norms of using Facebook use negatively impacted discontinuous usage behavior regarding Facebook. Individual users' personal norms have been reported to influence their behavior once they have recognized and internalized social media norms as their own subjective values and beliefs (Yazdanmehr and Wang, 2016). To this end, existing personal norms of using Facebook use played a crucial role in reducing the degree to which users discontinued using Facebook. This was also the case with users' habit of using Facebook in the current study. Past studies have alluded to the importance of habit formation in promoting IS continuation (Amoroso and Lim, 2017; Liu, Shao, and Fan, 2018). As Facebook usage becomes habitual, users perceive it to be a natural behavior, and, having become comfortable using it, they are less likely to stop using it.

Among push factors, dissatisfaction with Facebook use was shown to exert a stronger impact than fatigue with Facebook use on inducing discontinuous usage of Facebook. This confirms that, compared with dissatisfaction with Facebook use, users are less inclined to withdraw from Facebook owing to a feeling of fatigue with Facebook use. Moreover, the push factors' positive impacts (dissatisfaction and social media fatigue) on discontinuous usage of Facebook are stronger than that of the pull factor (alternative attractiveness). This finding shows that, compared with the attractiveness of other social media, users are more likely to abandon Facebook usage due to their own negative emotions and feelings in their Facebook use. Furthermore, among the mooring factors, the habit of using Facebook exerts a stronger

impact than personal norms of using Facebook on the discontinuous usage of Facebook. The findings show that users with the habit of using Facebook find it to be more difficult to discontinue their Facebook usage than those with personal norms that align with using Facebook. The reason for this might be that Facebook use has become automatic to them and hard to change compared to their personal norms of using Facebook.

7. Implications, limitations, and future research directions

7.1 Theoretical implications

Firstly, the findings made an important contribution to the extant literature regarding the identification of antecedents that influence discontinuous usage behavior regarding Facebook. Previous research on social media discontinuance has mostly focused on discontinuous usage intentions and provided limited insights into the next stage of discontinuous usage intentions in the social media use lifecycle, referring to actual discontinuous usage behavior (Maier *et al.*, 2015b; Chen *et al.*, 2019; Fu *et al.*, 2020). Specifically, this study provided empirical evidence on the factors leading to individual users' suspension of using Facebook for a limited period or completely.

Secondly, the study enriched the literature on social media discontinuance by adopting a PPM framework to evaluate the different effects of push, pull and mooring factors on inducing discontinuous usage behavior regarding Facebook. This study provided a comprehensive understanding of how different factors encourage or alleviate Facebook discontinuous usage behavior. Specifically, the PPM framework helped to explain how push factors (social media fatigue and dissatisfaction), pull factor (alternative attractiveness) and mooring factors (personal norms and habit of using social media) exerted different effects on Facebook discontinuance.

Thirdly, the current study enriched previous research on social media discontinuance by comparing the different effects of push, pull, and mooring factors on discontinuous usage behavior regarding Facebook. Specifically, this study revealed the positive impacts of fatigue and dissatisfaction with Facebook use (push factors), and alternative attractiveness (pull factor) as well as the negative impacts of personal norms and habit of using Facebook (mooring factors) on Facebook discontinuous usage behavior, and provided evidence on the relative importance of push, pull, and mooring factors in explaining Facebook discontinuous usage behavior, thereby extending the current understanding of social media discontinuance, with emphasis being placed on the different degrees of effect of the push, pull, and mooring factors on social media discontinuous usage behavior.

7.2 Practical implications

The findings of the current study have informed social media developers (e.g., Facebook) of the factors that are most significantly associated with users' discontinuous usage behavior. The research elucidates the push effects of fatigue and dissatisfaction with Facebook among users on their discontinuous usage behavior regarding Facebook. It provides actionable guidelines to Facebook regarding user retention through the alleviation of negative feelings and emotions. For instance, Facebook could allow users to set restrictions on their Facebook usage time, and personalized activities could be recommended to help users prevent fatigue in Facebook use. Conducting regular survey questionnaires concerning user needs and targeted service improvements might help to garner a better understanding of user dissatisfaction with

Facebook and proactively prevent it. For example, during the COVID-19 pandemic, Facebook could take measures to identify and remove false or fake information concerning COVID-19, thereby helping to prevent fatigue and dissatisfaction with Facebook use.

In addition, the positive relationship between alternative attractiveness and discontinuous usage behavior was clarified in the current study. It emphasizes, to Facebook, the importance of paying close attention to other competitive social media platforms. For instance, Facebook could investigate which functions or services led to the migration of its users to other social media platforms, such as Pinterest, Tumblr, and Flickr. Facebook should also actively collect intelligence concerning changing functions and service updates on other social media platforms.

Lastly, the empirical evidence obtained in this study suggests that personal norms and habit of using Facebook have the potential to decrease users' discontinuous usage behavior regarding Facebook. Specifically, strengthening connections between Facebook users could ensure them adherence to Facebook. Facebook should be cautious about setting too many structural restrictions as these could hinder the establishment of connections between its users. Marketing strategies, for example, economic incentives, could be implemented to encourage family members or friends of Facebook users to enroll new users and retain the original ones. Meanwhile, the mooring effect of habit of using Facebook highlighted the importance of increasing user dependence on Facebook. Facebook is advised to establish scoring systems and to regularly push personalized information to encourage the habitual use of Facebook by users.

7.3 Limitations and further research directions

Four caveats exist pertaining to the operationalization and conceptualization of the objectives of this study. Firstly, the questionnaire focused on a specific social media context (i.e., Facebook) rather than on the application of the research model to a general social media context. Cautions should be taken when generalizing the findings to other social media context. Thus, future research can extend this research to other social media platforms, such as Instagram, LinkedIn, and WhatsApp.

Secondly, push, pull, and mooring factors that were analyzed (i.e., social media fatigue, dissatisfaction, alternative attractiveness, personal norms, and habit of using social media) constitute a starting point for further research on social media discontinuance using the PPM framework. Push, pull, and mooring factors are broad concepts, and they can be assessed in many dimensions and in various ways. Thus, future research should test other push, pull and mooring factors in social media contexts and also evaluate the interactions between them.

Thirdly, in this study, an online survey was conducted through the online crowdsourcing platform, MTurk. To expand upon this, future research should collect data across different online channels or through Facebook.

Lastly, future research could determine the antecedents that encourage discontinuous usage behavior in social media contexts from different theoretical perspectives and specifically during COVID-19.

References

Amoroso, D. and Lim, R. (2017), "The mediating effects of habit on continuance intention", *International Journal of Information Management*, Vol. 37, No. 6, pp. 693-702.

Apuke, O. D. and Omar, B. (2021), "Fake news and COVID-19: modelling the predictors of fake news sharing among social media users", *Telematics and Informatics*, Vol. 56, pp. 101475.

Barclay, D., Higgins, C. and Thompson, R. (1995), "The partial least squares (PLS) approach to causal modeling: personal computer adoption and use as an illustration", *Technology Studies*, Vol. 2, No. 2, pp. 285–309.

Beyens, I., Frison, E. and Eggermont, S. (2016), "'I don't want to miss a thing': adolescents' fear of missing out and its relationship to adolescents' social needs, Facebook use, and Facebook related stress", *Computers in Human Behavior*, Vol. 64, pp. 1–8.

Bhattacherjee, A. (2001), "Understanding information systems continuance: an expectation-confirmation model", *MIS Quarterly*, Vol. 25, No. 3, pp. 351–370.

Cao, X. and Sun, J. (2018), "Exploring the effect of overload on the discontinuous intention of social media users: an SOR perspective", *Computers in Human Behavior*, Vol. 81, pp. 10-18.

Chang, I. C., Liu C. C. and Chen, K. (2014), "The push, pull, and mooring effects in virtual migration for social networking sites", *Information Systems Journal*, Vol. 24, No. 4, pp. 323–346.

Chen, J. V., Tran, A. and Nguyen, T. (2019), "Understanding the discontinuance behavior of mobile shoppers as a consequence of technostress: an application of the stress-coping theory", *Computers in Human Behavior*, Vol. 95, pp. 83–93.

Chen, Y. H. and Keng, C. J. (2019), "Utilizing the push-pull-mooring-habit framework to explore users' intention to switch from offline to online real-person English learning platform", *Internet Research*, Vol. 29, No. 1, pp. 167–193.

Cinelli, M., Quattrociocchi, W., Galeazzi, A. et al. (2020), "The covid-19 social media infodemic", *Scientific Reports*, Vol. 10, No. 1, pp. 1-10.

Dhir, A., Yossatorn, Y., Kaur, P. and Chen, S. (2018), "Online social media fatigue and psychological wellbeing—a study of compulsive use, fear of missing out, fatigue, anxiety and depression", *International Journal of Information Management*, Vol. 40, pp. 141–152.

Fang, Y. H. and Tang, K. (2017), "Involuntary migration in cyberspaces: the case of MSN messenger discontinuation", *Telematics and Informatics*, Vol. 34, No. 1, pp. 177–193.

Fornell, C. and Bookstein, F. L. (1982), "Two structural equation models: LISREL and PLS applied to consumer exit-voice theory", *Journal of Marketing Research*, Vol. 19, No. 4, pp. 440–452.

Fornell, C. and Larcker, D. F. (1981), "Evaluating structural equation models with unobservable variables and measurement error", *Journal of Marketing Research*, Vol. 18, No. 1, pp. e39.

Fu, J. R. (2011), "Understanding career commitment of IT professionals: perspectives of push–pull–mooring framework and investment model", *International Journal of Information Management*, Vol. 31, No. 3, pp. 279–293.

Fu, S., Li, H., Liu, Y., Pirkkalainen, H. and Salo, M. (2020), "Social media overload, exhaustion, and use discontinuance: examining the effects of information overload, system feature overload, and social overload", *Information Processing and Management*, Vol. 57, No. 6, pp. e102307.

Furneaux, B. and Wade, M. R. (2011), "An exploration of organizational level information systems discontinuance intentions", *MIS Quarterly*, Vol. 35, No. 3, pp. 573–598.

Gan, C. M. and Li, H. X. (2018), "Understanding the effects of gratifications on the continuance intention to use WeChat in China: a perspective on uses and gratifications", *Computers in Human Behavior*, Vol. 78, pp. 306–315.

Gefen, D., Rigdon, E. E. and Straub, D. (2011), "An update and extension to SEM guidelines for administrative and social science research", *MIS Quarterly*, Vol. 35, No. 2, pp. 3–14.

Handarkho, Y. D. and Harjoseputro, Y. (2020), "Intention to adopt mobile payment in physical stores: individual switching behavior perspective based on Push-Pull-Mooring (PPM) theory", *Journal of Enterprise Information Management*, Vol. 33, No. 2, pp. 285-308.

Hinton, P. R., McMurray, I. and Brownlow, C. (2014), SPSS explained. New York, NY: Routledge.

Hwang, H. S., Shim, J. W. and Park, S. B. (2019), "Why we migrate in the virtual world: factors affecting switching intentions in SNS", *Information, Communication and Society*, Vol. 22, No. 14, pp. 2127–2137.

Jones, M. A., Mothersbaugh, D. L. and Beatty, S. E. (2000), "Switching barriers and repurchase intentions in services", *Journal of Retailing*, Vol. 76, No. 2, pp. 259–274.

Kass, R. A. and Tinsley, H. E. A. (1979), "Factor analysis", *Journal of Leisure Research*, Vol. 11, pp. 120–138.

Keil, M., Tan, B. C., Wei, K. K., Saarinen, T., Tuunainen, V. and Wassenaar, A. (2000), "A cross-cultural study on escalation of commitment behavior in software projects", *MIS Quarterly*, Vol. 24, No. 2, pp. 299-325.

Kim, G., Shin, B. and Lee, H. G. (2006), "A study of factors that affect user intentions toward email service switching", *Information and Management*, Vol. 43, No. 7, pp. 884–893.

Laato, S., Islam, A. N., Islam, M. N. and Whelan, E. (2020), "What drives unverified information sharing and cyberchondria during the COVID-19 pandemic?", *European Journal of Information Systems*, Vol. 29, No. 3, pp. 288-305.

Lee, E. S. (1966), "A theory of migration", *Demography*, Vol. 3, No. 1, pp. 47–57.

Li, Y., Liu, H., Lim, E. T., Goh, J. M., Yang, F. and Lee, M. K. (2018), "Customer's reaction to cross-channel integration in omnichannel retailing: the mediating roles of retailer uncertainty, identity attractiveness, and switching costs", *Decision Support Systems*, Vol. 109, pp. 50-60.

Limayem, M., Hirt, S. G. and Cheung, C. M. K. (2007), "How habit limits the predictive power of intention: the case of information systems continuance", *MIS Quarterly*, Vol. 31, No. 4, pp. 705-737.

Liu, Q., Shao, Z. and Fan, W. (2018), "The impact of users' sense of belonging on social media habit formation: empirical evidence from social networking and microblogging websites in China", *International Journal of Information Management*, Vol. 43, pp. 209–223.

Loveman, G. W. (1998), "Employee satisfaction, customer loyalty, and financial performance: an empirical examination of the service profit chain in retail banking", *Journal of Service Research*, Vol. 1, No. 1, pp. 18–31.

Lozano, E. B. and Fraley, R. C. (2021), "Put your mask on first to help others: attachment and sentinel behavior during the COVID-19 pandemic", *Personality and Individual Differences*, Vol. 171, pp. e110487.

Luqman, A., Cao, X., Ali, A., Masood, A. and Yu, L. (2017), "Empirical investigation of Facebook discontinues usage intentions based on SOR paradigm", *Computers in Human Behavior*, Vol. 70, pp. 544-555.

Maier, C., Laumer, S., Eckhardt, A. and Weitzel, T. (2015a), "Giving too much social support: Social overload on social networking sites", *European Journal of Information Systems*, Vol. 24, No. 5, pp. 447–464.

Maier, C., Laumer, S., Weinert, C. and Weitzel, T. (2015b), "The effects of technostress and switching stress on discontinued use of social networking services: A study of Facebook use", *Information Systems Journal,* Vol. 25, No. 3, pp. 275–308.

Malik, A., Dhir, A. and Nieminen, M. (2016), "Uses and gratifications of digital photo sharing on Facebook", *Telematics and Informatics*, Vol. 33, No. 1, pp. 129–138.

Moon, B. (1995), "Paradigms in migration research: exploring 'moorings' as a schema", *Progress in Human Geography*, Vol. 19, No. 4, pp. 504–524. Moss, S., Prosser, H., Costello, H., Simpson, N., Patel, P., Rowe, S. et al. (1998), "Reliability and validity of the PAS-ADD checklist for detecting psychiatric disorders in adults with intellectual disability", *Journal of Intellectual Disability Research*, Vol. 42, No. 2, pp. 173–183.

Neter, J., Kutner, M. H., Nachtsheim, C. J. and Wasserman, W. (1996), *Applied linear statistical models*, Chicago, IL: Irwin.

Osterhus, T. L. (1997), "Pro-social consumer influence strategies: when and how do they work?", *Journal of Marketing*, Vol. 61, No. 4, pp. 16-29.

Parthasarathy, M. and Bhattacherjee, A. (1998), "Understanding post-adoption behavior in the context of online services", *Information Systems Research*, Vol. 9, No. 4, pp. 362–379.

Patterson, P. G. and Smith, T. (2003), "A cross-cultural study of switching barriers and propensity to stay with service providers", *Journal of Retailing*, Vol. 79, No. 2, pp. 107–120.

Peng, X., Zhao, Y. and Zhu, Q. (2014), "Understanding post adoption switching behavior for mobile instant messaging application in China: based on migration theory", In *PACIS*, pp. e 239.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y. and Podsakoff, N. P. (2003), "Common method biases in behavioral research: a critical review of the literature and recommended remedies", J*ournal of Applied Psychology*, Vol. 88, No. 5, pp. 879–903.

Polites, G. L. and Karahanna, E. (2012), "Shackled to the status quo: the inhibiting effects of incumbent system habit, switching costs, and inertia on new system acceptance", *MIS Quarterly*, Vol. 36, No. 1, pp. 21-42.

Polites, G. L., Serrano, C., Thatcher, J. B. and Matthews, K. (2018), "Understanding social networking site (SNS) identity from a dual systems perspective: an investigation of the dark side of SNS use", *European Journal of Information Systems*, Vol. 27, No. 5, pp. 600–621.

Ravindran, T., Yeow Kuan, A. C. and Hoe Lian, D. G. (2014), "Antecedents and effects of social network fatigue", *Journal of the Association for Information Science and Technology*, Vol. 65, No. 11, pp. 2306–2320.

Ried, L., Eckerd, S., Kaufmann, L. and Carter, C. (2020), "Spillover effects of information leakages in buyer–supplier–supplier triads", *Journal of Operations Management*, Vol. 67, No. 3, pp. 280-306.

Schwartz, S. H. (1977), "Normative influences on altruism1", *Advances in Experimental Social Psychology*, Vol. 10, pp. 221-279.

Shen, X. L., Li, Y. J. and Sun, Y. (2018), "Wearable health information systems intermittent discontinuance: a revised expectation-disconfirmation model", *Industrial Management and Data Systems*, Vol. 118, No.3, pp. 506–523.

Shokouhyar, S., Siadat, S. H. and Razavi, M. K. (2018). "How social influence and personality affect users' social network fatigue and discontinuance behavior", *Aslib Journal of Information Management*, Vol. 70, No. 4, pp. 344–366.

Shi, S., Mu, R., Lin, L., Chen, Y., Kou, G. and Chen, X. J. (2018), "The impact of perceived online service quality on swift guanxi", *Internet Research*, Vol. 28, No. 2, pp. 432–455.

Singh, R. and Rosengren, S. (2020), "Why do online grocery shoppers switch? An empirical investigation of drivers of switching in online grocery", *Journal of Retailing and Consumer Services*, Vol. 53, pp. 101962.

Soror, A. A., Hammer, B. I., Steelman, Z. R., Davis, F. D. and Limayem, M. M. (2015), "Good habits gone bad: explaining negative consequences associated with the use of mobile phones from a dual-systems perspective", *Information Systems Journal*, Vol. 25, No. 4, pp. 403–427.

Soroya, S. H., Farooq, A., Mahmood, K., Isoaho, J. and Zara, S. E. (2021), "From information seeking to information avoidance: understanding the health information behavior during a global health crisis", *Information Processing and Management,* Vol. 58, No. 2, pp. e102440.

Statista (2020), "Number of Facebook users worldwide from 2015 to 2020", Available at: https://www.statista.com/statistics/490424/number-of-worldwide-facebook-users/ (accessed on June 17, 2020).

Statista (2021), "Facebook: distribution of global audiences 2021", Available at: https://www.statista.com/statistics/376128/facebook-global-user-age-distribution/ (accessed on July 6, 2021).

Suh, A. and Li, M. (2021), "Digital tracing during the COVID-19 pandemic: user appraisal, emotion, and continuance intention", *Sustainability*, Vol. 13, No. 2, pp. e608.

Sun, Y., Liu, D., Chen, S., Wu, X., Shen, X. L. and Zhang, X. (2017), "Understanding users' switching behavior of mobile instant messaging applications: an empirical study from the perspective of push-pull-mooring framework", *Computers in Human Behavior*, Vol. 75, pp. 727-738.

Susanty, A., Handoko, A. and Puspitasari, N. B. (2020), "Push-pull-mooring framework for e-commerce adoption in small and medium enterprises", *Journal of Enterprise Information Management*, Vol. 33, No. 2, pp. 381-406.

Tang, Z. and Chen, L. (2020), "An empirical study of brand microblog users' unfollowing motivations: the perspective of push-pull-mooring model", *International Journal of Information Management*, Vol. 52, pp. e102066.

Tang, Z., Chen, L. and Gillenson, M. L. (2019), "Understanding brand fan page followers' discontinuance motivations: a mixed-method study", *Information and Management*, Vol. 56, No. 1, pp. 94–108.

Tinsley, H. E. and Tinsley, D. J. (1987), "Uses of factor analysis in counselling psychology research", *Journal of Counselling Psychology*, Vol. 34, No. 4, pp. 414–424.

Turel, O. (2015), "Quitting the use of a habituated hedonic information system: a theoretical model and empirical examination of Facebook users", *European Journal of Information Systems*, Vol. 24, No. 4, pp. 431–446.

Vandenbergh, M. P. (2005), "Order without social norms: how personal norm activation can protect the environment", *Northwestern University Law Review*, Vol. 99, pp. 1101–1166.

Venkatesh, V., Thong, J. Y. and Xu, X. (2012), "Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology", *MIS Quarterly,* Vol 36, No 1. pp. 157-178.

Xu, Y. C., Yang, Y., Cheng, Z. and Lim, J. (2014), "Retaining and attracting users in social networking services: an empirical investigation of cyber migration", *The Journal of Strategic Information Systems*, Vol. 23, No. 3, pp. 239–253.

Yao, X., Phang, C. W. and Ling, H. (2015), "Understanding the influences of trend and fatigue in individuals' SNS switching intention. In *48th Hawaii International Conference on System Sciences*, pp. 324–334.

Yazdanmehr, A. and Wang, J. (2016), "Employees' information security policy compliance: a norm activation perspective", *Decision Support Systems*, Vol. 92, pp. 36–46.

Zhang, P. and Von Dran, G. M. (2000), "Satisfiers and dissatisfiers: a two-factor model for website design and evaluation", *Journal of the American Society for Information Science*, Vol. 51, No. 14, pp. 1253–1268.

Zhang, S., Zhao, L., Lu, Y. and Yang, J. (2016), "Do you get tired of socializing? An empirical explanation of discontinuous usage behavior in social network services", *Information and Management*, Vol. 53, No. 7, pp. 904–914.

Appendix. Construct items included in this study

Construct	Items	Source
Facebook fatigue (FF)	(FF1) I feel tired from my Facebook activities.	Maier et al., 2015a
	(FF2) I feel drained from activities that require me to use Facebook.	
	(FF3) Using Facebook is a strain for me.	
	(FF4) I feel burned out from my Facebook activities.	
Dissatisfaction (DS)	(DS1) I feel dissatisfied about my overall experience using Facebook.	Shen, Li and Sun, 2018
	(DS2) I feel displeased about my overall experience using Facebook.	
	(DS3) I felt discontented about my overall experience using Facebook.	
	(DS4) I am not delighted about my overall experience using Facebook.	
Alternative attractiveness (AA)	(AA1) If I need to change SNS, there are other good SNS to choose from.	Jones, Mothersbauh, and Beatty, 2000
	(AA2) I would probably be happy with the features and services of another SNS.	
	(AA3) Compared to Facebook, there are other SNS with which I would probably be more satisfied.	
Personal norms (PN)	(PN1) I believe it is perfectly fine to share news with friends by using Facebook.	Polites et al. 2018
	(PN2) I think the right way for me to share news with friends is by using Facebook.	
	(PN3) I am in favor of the use of Facebook to share news with friends.	
	(PN4) Personally, I think it's ok to use Facebook to share news with friends.	
Habit of using Facebook (HUF)	(HUF1) Using Facebook has become automatic to me.	Limayem, Hirt, and Cheung, 2007
	(HUF2) Using Facebook is natural to me.	
	(HUF3) When I want to interact with friends and relatives, using Facebook is an obvious choice for me.	
Discontinuous usage behavior (DUB)	(DUB1) I sometimes discontinue my use of Facebook, but that does not mean that I will completely abandon the use of it.	Maier et al., 2015b; Shen, Li and Sun, 2018
	(DUB2) I have suspended my use of Facebook.	
	(DUB3) I have discontinued my use of Facebook.	
	(DUB4) I have stopped using Facebook.	
	(DUB5) I have quit Facebook.	