Trust and the Flow Experience on Facebook: What Motivates Social Network Usage?

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Abstract. Social networking sites (SNSs) have become one of the most frequently used communication media. While many studies have examined the motivations of SNS usage and visiting behaviors, this study mainly focuses on exploring the role of trust in an SNS and intrinsic motivational factors affecting continuous usage behaviors, using the flow theory. Using a web-based survey of 291 college students, the age group that most frequently uses SNSs, our research findings suggest theoretical insights. The flow experience—consisting of perceived enjoyment, perceived control, and concentration—serves as a salient antecedent to explaining SNS users' satisfaction, which in turn has a positive effect on continuous use of an SNS. Intent for continuous usage of an SNS mediates the relationships between satisfaction and actual use behaviors. Our research findings also reveal that trust in an SNS significantly affects all other constructs, including perceptions of SNS users, intentions, and actual behaviors. Further discussion is detailed, and the limitations of this research are addressed.

Keywords: Social networking sites · Trust · Flow theory
Partial least square (PLS)

1 Introduction

Among many types of computer-mediated communication (CMC), including email, chatting, blogging, and social networking sites (SNSs), SNSs are phenomenally popular. Prior literature defined SNSs as follows:

> "Web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system." [5, p. 211]

Within a bounded system of premade personal profiles, two-way interaction with other SNS users bypasses a lack of physical coherence and the limitations of timing. Thus, SNSs help extend personal networking. Currently, Facebook is one of the most well-known SNSs; as of May 2016, it has more than 1.65 billion active monthly users, which is increasing by 15% each year [51]. Recent surveys also show that the average time of a Facebook visit in the U.S. is 40 min, the average Twitter visit is 34 min [43], and the largest group of Facebook users (30%) comprises those between 25 and 34 years old [51].

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Since the 1997 emergence of the first SNS, SixDegrees.com, this new, innovative medium of communication has been supported by Web 2.0 applications in the online network environment. As opposed to face-to-face (FtF) communication, where people have physical contact in a geographic location with one or more other people, CMC signifies social sharing and socio-emotional communication in an online environment through nonverbal cues with no physical expression (e.g., facial movement, eye contact, gestures). The literature indicates these nonverbal cues are easily adopted by communicators, thereby facilitating the development of effective relationships in an online communication environment [39]. As a type of CMC, SNSs are popularly regarded as representative of "online communities," a term stemming from the social perspective approach [24]. Such communities can be viewed from a social perspective if community members being motivated to build a network, share personal interests, and/or exchange useful information [50]. They can be viewed from a business perspective if community members' motivation is based on pursuit of goals reflecting their shared interests.

Regarding the impact of an SNS, such as Facebook (facebook.com) and Twitter (twitter.com), on the public as a new communication medium, earlier literature has revealed several important findings. First, research suggests that preferred SNSs differ according to ethnic and cultural background [21]. For instance, Mixi (mixi.jp) is the most popular SNS in Japan, with an estimated 14 million accounts [48]. Second, from a marketing perspective, the advertising effect has increased significantly between commercial companies and SNS users, resulting in rapidly increasing advertisement expenditures. Despite the significant marketing expenditure cutback in traditional media (i.e., advertising in printed media, radio and television decreased at least 22%) because of the recession, marketers are still apt to increase their advertising budget for online media [17]. Third, many researchers have found that the majority of SNS users are college-aged and young-adult people who lead the SNS culture by proffering their communication media, such as sharing multimedia content like photos and videos [40]. Interestingly, Muise et al. [36] found that Facebook usage induced feelings of jealousy between romantic partners because of a partner's dubious or ambiguous status, leading one to visit their significant other's page more often.

Regardless of the implications and findings of prior studies with respect to the influence of SNSs on public users, because of several critical issues, scholars are still debating whether SNS users are persistent or temporary. For example, in an early study of Facebook, profile owners' identity exposure and privacy concerns were important issues in terms of SNS users retaining continuous activities [29]. While Foster et al. [17] acknowledged the importance of motivation for user participation in online social networks, their research failed to delineate constructive relationships among motivation factors or illustrate how they combine to describe SNS users' visiting behaviors. Generally, SNS users are free from switching costs when moving from one SNS to another, so researchers have not been able to explain why some SNSs users are faithful to one SNS over others [25]. Consequently, the present study sheds special light on this area, raising the following research questions:

RQ1: What factors affect SNS users in such a way that they continue to use certain SNSs under the state of flow and flow experience?

RQ2: How does trust in an SNS affect users' continued usage behaviors?

This study is designed to identify factors that affect SNS users' continued use by integrating flow theory and concepts of trust into the research model. First, we argue that flow theory is the theoretical background to explain emotional pleasure and helps examine the intrinsic motivation of media use [27]. Flow theory is useful for capturing people's involvement in activities during which they feel nothing else matters [11]. Another aspect of our research is to employ the concept of trust in an SNS. Regarding shared profiles within a "friends" network in an SNS as a communication medium, trust in communicating parties and the communication platform itself is necessary [6]. It is true that greater trust in communication media induces more usage of such media, resulting in a greater feeling of effective communication and a closer relationship. Prior literature also identified that trust is an important determinant of building commitment and initiating enhanced relationships [35]. Unlike prior literature that measured the impact of trust on limited constructs, we examine the overall impact of trust on users' perception of continued use of an SNS. As primary antecedents, we also examined an influence of the status of flow on a user's satisfaction with SNS use, as well as the impact of satisfaction on continuous usage behaviors.

The Sect. 2 of this paper reviews the theoretical background and presents a research framework with hypotheses. The Sect. 3 describes research methods, and the Sect. 4 presents the data analysis and results. The Sect. 5 discusses the findings and implications, and the Sect. 6 contains the limitations of the current research, ideas for future research, and concluding remarks.

2 Theoretical Background and Hypothesis Development

2.1 The State of Flow and Flow Experience

In order to examine SNS usage behaviors, researchers have attempted to explain the reciprocal interactions between SNSs and their users by employing social psychological theories such as social capital theory, social influence, social network theory, and the behavior-chain model [8, 28, 44]. Along with those researchers' efforts to use social psychological theories, over the past couple of years, the concept of flow has been adopted by information systems (IS) researchers to examine users' total involvement while using a computer communication medium in the context of IS [27]. Unlike perceived usefulness, which is anchored in extrinsic motivation and defined as "the desire to perform an activity because it is perceived to lead to distinct and valued outcomes" [33, p. 31], the state of flow generally stems from intrinsic motivation, which is focused more on the inner desire to engage in an activity.

In the seminal research on the concept, Csikszentmihalyi [12] defined *flow* as "the state in which people are so involved in an activity that nothing else seems to matter" (p. 4). Similarly, Hsu and Lu [23] viewed the state of flow as an extremely enjoyable experience in the context of an online game. This implies that the intrinsic motivation of people in a flow state results in no awareness of themselves, a sense of control, and a loss of self-consciousness in an activity [1]. It is "a narrowing of the focus of awareness, so that irrelevant perceptions and thoughts are filtered out, by loss of

self-consciousness, by responsiveness to clear goals and unambiguous feedback, and by a sense of control over the environment" [11, p. 72].

Although the concept of flow has been acknowledged in many academic disciplines as a state of absorbance in an activity and total involvement with no awareness, measuring state of flow is regarded as rather complex because of the term's unclear definition and the multiple dimensions addressed by many researchers [23]. Originally, Csikszentmihalyi [12] suggested four dimensions: intense concentration, a loss of self-consciousness, a sense of being in control, and a transformation of time. Afterward, Ghani and Deshpande [19] suggested two dimensions of flow: concentration and perceived enjoyment. Trevino and Webster [46] then developed four dimensions—control, curiosity, intrinsic interest, and attention focus—as characteristics of people in the flow state in the context of human-technology interaction. Using independently developed items, Webster et al. [49] empirically measured Trevino and Webster's [46] four dimensions of flow. However, their study had limitations in that their empirical test did not clearly identify intrinsic interest and curiosity because of the sample size [1]. Unlike other scholars, Hoffman and Novak [22] found that the four dimensions of the flow state served as antecedents rather than major dimensions in the context of a computer-mediated environment. Recently, Li and Browne's [30] research examined the effect of four dimensions—focused attention, control, temporal dissociation, and curiosity—on two personal aspects: cognition and mood. The findings indicated that only mood was significant related to the four dimensions. In extending the concept of flow, Agarwal et al. [2] introduced a new dimension, cognitive absorption, which incorporates Trevino and Webster's [46] four dimensions with computer playfulness and ease of use [24].

Among the suggested dimensions for measuring an individual's flow state, this study selected perceived enjoyment, perceived control, and concentration (or focused attention) to explain absorbance in SNS use and its association with actual continued use.

2.2 The Role of the State of Flow

Csikszentmihalyi [12] suggested four dimensions: intense concentration, a loss of self-consciousness, a sense of being in control, and a transformation of time. However, measuring the state of flow is still complex because of the term's unclear definition and the multiple dimensions addressed by many researchers [23]. Although multi-dimensional constructs of the state of flow have been applied to studying total involvement in an environment, our study adopts three constructs—perceived enjoyment, perceived control, and concentration—following Koufaris's [27] research.

First, concentration is an important dimension related to users' becoming absorbed in the state of flow; performing multiple simultaneous tasks distracts users' focused attention [37]. Li and Browne [30] asserted that a bad mood diminishes a user's focused attention in the HCI environment because it results in the user seeking external information to rectify a distressed internal state. Second, perceived enjoyment is defined as "the extent to which the activity of using a specific system is perceived to be enjoyable in its own right, aside from any performance consequences resulting from system use" [33, p. 32]. A number of prior studies have indicated that perceived

enjoyment induced feelings of pleasure and fun in the CMC environment and had a positive effect on users' adoption of CMC technology [46]. Perceived enjoyment was also a key factor in the formation of loyalty in the context of online shopping [27] and of sellers returning to an auction marketplace [45]. Third, perceived control is defined as "the level of one's control over the environment and one's actions" [27, p. 208]. For example, SNS users is freed from the geographic and time restrictions of the communication environment because they do not need to make an appointment to talk to friends. Rather, they enjoy unlimited access to friends during log-in hours, all of which may lead them to feel more in control. This makes them expend less physical and mental effort to communicate and lets them take advantage of high-efficiency time management in their daily schedule.

Recently, many SNSs have provided user-friendly features for easier communication, such as convenient photo uploading, real-time chatting, and instant messaging services. Such web applications result in increasing levels of control and enjoyment on the part of SNS users. Therefore, we posit:

H1: An SNS user's concentration while using an SNS is positively associated with his or her satisfaction with an SNS.
H2: An SNS user's perceived enjoyment of an SNS is positively associated with his or her satisfaction with an SNS.
H3: An SNS user's perceived control of an SNS is positively associated with his or her satisfaction with an SNS.

2.3 The Role of Satisfaction in Intention and Continuous Use Behavior

Satisfaction is defined as "the summary psychological state resulting when the emotion surrounding disconfirmed expectation is coupled with the consumer's prior feelings about the consumption experience" [38, p. 29]. It means that after consuming products or rendering services, the customer determines the confirmation level. This is done in such a way that higher confirmation is achieved when greater gaps occur between the pre-purchase expectation of products or services and the post-purchase performance. Customer satisfaction is assessed via the level of confirmation: When post-purchase performance outweighs the customer's pre-purchase expectations, it is regarded as fulfillment of the customer's expectations, indicating positive customer satisfaction [3].

Prior literature supports the positive association between satisfaction and behavioral intention or actions. For example, Tsai et al. [47] found that an increase in a customer's satisfaction led to an increase in the rate of re-purchase. Eriksson and Nilsson [15] revealed that user satisfaction was one of the primary motivations behind continued usage. Bhattacherjee's [4] research found that actual continuance behavior is also associated with intention to continue. Placing the above discussion in the context of SNS, we posit:

H4: An SNS user's satisfaction is positively associated with his or her (a) intention to continue using the SNS and (b) actual continued use of an SNS.
H5: An SNS user's intention to continue using an SNS is positively associated with his or her actual continued use of an SNS.

2.4 The Role of Trust in SNS User Perceptions

Trust is defined as "the willingness of a party to be vulnerable to the actions of another party, with the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party" [31, p. 1883]. Prior literature described trust in multiple ways depending on its use. For example, in early research, Zucker [52] categorized trust as three different types (1) characteristic-based trust, which relies on general (e.g., culture) or specific (e.g., family) similarities and commonalities; (2) process-based trust, which is anchored in the level of satisfaction of prior transactions or experience; and (3) institution-based trust, which depends on the third party's guarantee under a form of certification. Trust is a salient determinant for maintaining sustainable relationships because it plays a significant role in reducing the uncertainty and risk of a relationship, reduces anxiety about opportunism, and boosts mutuality among community members [50]. Accordingly, our study proposes the importance of trust for SNSs in that the combination of low associated risk and high trust increases willingness to conduct communicating behaviors, emotional motivation, and the development of intention. Additionally, trust affects people's satisfaction level [10]. For example, Deng et al. [14] research indicated that customers' recognition of poor service or an inferior product based on past experience had a negative effect on satisfaction, as well as that trust was a significant predictor of customer satisfaction in the context of mobile instant messaging services. Because trust alleviates uncertainty, we claim additionally that high levels of trust in an SNS directly influences visiting behaviors. Therefore, we posit:

H6: An SNS user's trust in an SNS will be positively associated with the user's (a) perceived control, (b) perceived enjoyment, (c) concentration, (d) satisfaction, (e) intention to continue use, and (f) actual continued use (Fig. 1).

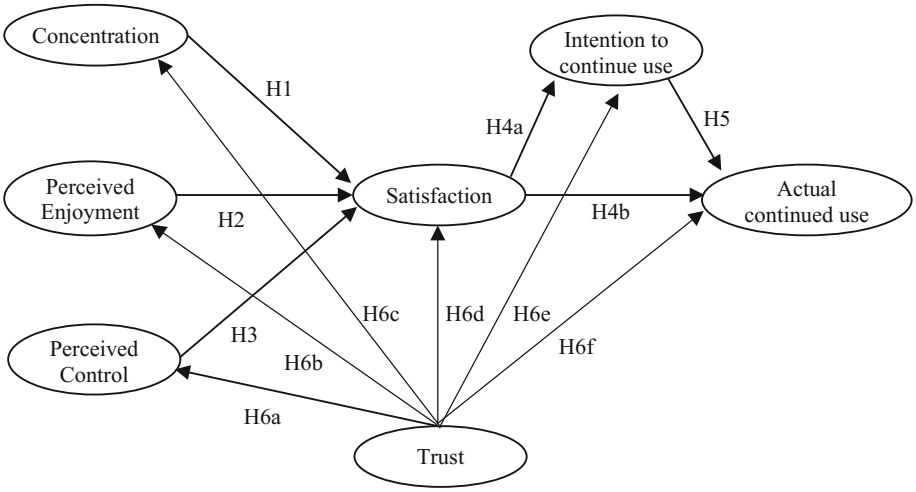

Fig. 1. Research model and hypotheses

3 Research Method

3.1 Research Context

We considered student participants for this study who currently use Facebook. We agreed that student samples are meaningful because students are already familiar with SNS use (e.g., instant messaging) as well as face-to-face conversation [40]. Other research has used students as survey participants for similar reasons, so this study administered a survey to college students to measure their intention to continue using SNSs and their actual usage behaviors [34]. First, we informed the participants regarding the purpose of the study and explained how to participate in the web-based survey, assuring them that it was completely anonymous. Afterward, an email containing the survey link was sent to the individual participants before they participated.

3.2 Selection of Measurement Items

A total of 7 constructs measured perceptions of the SNS, usage intention, and actual continued usage behaviors, using questionnaires modified to fit the research purpose. Four items for measuring satisfaction were adopted from Spreng et al. [42] and 3 items for intention to continued use were adopted from Bhattacherjee [3]. Three items for measuring actual continued use were adopted from Bhattacherjee et al. [4], and trust was measured by 4 items from Fogel and Nehmad [16]. In addition, some items were adopted from Koufaris [27]: 4 to measure perceived enjoyment, 3 to measure perceived control, and 4 to measure concentration. Four items measure the period of Facebook use. Gender and age were also measured. The survey items of trust, perceived enjoyment, perceived control, concentration, and intention were assessed via a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Satisfaction was measured using a 7-point bipolar scale. The number of items and their resources with detailed questions are listed in Appendix A.

Table 1. Participant descriptions

Demographics		Respondents	Percent
Gender	Male	165	56.7%
	Female	123	42.3%
	No response	3	1.0%
Age	19–22	192	66.0%
	23–27	62	21.3%
	28–32	16	5.5%
	32+	17	5.8%
	No response	4	1.4%
Facebook usage	More than 5 years	135	46.4%
	3–5 years	99	34.0%
	1–3 years	38	13.1%
	Less than 1 year	19	6.5%

3.3 Data Collection

In this study, 291 participants in Southeastern University in the U.S. participated in a web-based survey. Table 1 shows detailed demographic information: 80.4% of survey respondents have used Facebook for more than 3 years, and 54.3% visit Facebook at least 10 times per week.

4 Results

To analyze survey responses and test hypotheses, we used the partial least squares (PLS) statistical method using WarpPLS 5.0 [26]. All constructs are reflective.

4.1 Measurement Model Assessment

Convergent Validity. To examine the convergent validity of constructs, we considered the following four factors of each construct across all measured items: composite reliability, Cronbach's alpha, average variance extracted (AVE), and factor loadings (Table 2). First, all composite reliabilities ranged between 0.82 and 0.96, which qualifies them for the suggested criterion of 0.7 [20]. Second, Cronbach's alpha is over 0.68 for all constructs, which exceeds the minimum requirement suggested by prior literature [20]. Third, the average variance extracted (AVE) of all constructs was above the recommendation value of 0.5 [9]. Lastly, all pattern factor loadings and cross-loadings of measurement items (Table 3) ranged from 0.97 to 0.72, which qualifies them for the suggested the value of 0.7 and above [9]. Examining all four components, our measurement model achieves convergent validity.

Table 2. Convergent validity

Constructs	Composite reliability	Cronbach's alpha	AVE
Concentration	0.95	0.93	0.82
Perceived enjoyment	0.96	0.94	0.85
Perceived control	0.85	0.72	0.65
Satisfaction	0.92	0.88	0.73
Intention to continue use	0.82	0.68	0.61
Actual continued use	0.89	0.81	0.73
Trust	0.94	0.91	0.79

Discriminant Validity. The study also assessed discriminant validity via comparing the square root of each construct's AVE and correlations; the square root of each construct's AVE should be higher than the correlations [20]. Analysis results confirmed all construct correlations are higher than the square root of AVEs; discriminant validity is met under such criteria (see Table 4).

Table 3. Pattern factor loadings and cross-loadings

Constructs	Conc	Enj	Control	Sat	Int	Ac	Trust
Conc1	**0.86**	0.10	−0.04	−0.08	−0.02	0.13	−0.02
Conc2	**0.91**	−0.05	0.06	0.07	0.06	−0.11	−0.02
Conc3	**0.97**	−0.09	0.05	0.05	0.05	−0.12	0.02
Conc4	**0.89**	0.04	−0.07	−0.04	−0.08	0.11	0.02
Enj1	0.02	**0.91**	−0.09	0.06	0.02	−0.05	−0.01
Enj2	−0.06	**0.88**	0.13	−0.04	0.09	−0.03	0.00
Enj3	0.06	**0.94**	−0.08	0.01	−0.07	0.04	0.03
Enj4	−0.02	**0.96**	0.03	−0.03	−0.04	0.03	−0.02
Control1	0.04	0.03	**0.87**	−0.04	0.05	−0.09	−0.07
Control2	0.08	0.07	**0.82**	−0.12	0.03	−0.03	0.04
Control3	−0.14	−0.12	**0.72**	0.20	−0.11	0.14	0.04
Sat1	−0.05	0.03	0.04	**0.74**	0.11	−0.03	0.04
Sat2	−0.10	0.00	0.05	**0.94**	0.01	0.04	−0.04
Sat3	0.08	−0.09	0.03	**0.89**	−0.03	−0.03	−0.01
Sat4	0.07	0.06	−0.13	**0.85**	−0.08	0.01	0.01
Int1	−0.06	0.01	0.12	0.05	**0.76**	0.00	−0.04
Int2	−0.02	0.19	−0.22	−0.17	**0.73**	0.08	−0.01
Int3	0.07	−0.17	0.07	0.10	**0.85**	−0.06	0.05
Ac1	0.09	0.07	−0.11	−0.05	0.08	**0.75**	0.04
Ac2	−0.04	−0.05	0.06	0.02	−0.11	**0.97**	−0.02
Ac3	−0.04	−0.02	0.05	0.02	0.04	**0.83**	−0.02
Trust1	−0.02	−0.09	0.12	0.08	0.07	0.04	**0.77**
Trust2	−0.01	0.08	−0.05	0.03	−0.07	0.01	**0.91**
Trust3	0.00	0.01	−0.03	−0.01	−0.01	0.03	**0.93**
Trust4	0.03	−0.01	−0.03	−0.10	0.02	−0.08	**0.94**

Table 4. Discriminant validity

Constructs	Conc	Enj	Control	Sat	Int	Ac	Trust
Concentration	**0.91**						
Perceived enjoyment	0.55	**0.92**					
Perceived control	0.23	0.55	**0.81**				
Satisfaction	0.39	0.51	0.37	**0.86**			
Intention	0.29	0.44	0.34	0.47	**0.78**		
Ac	0.35	0.41	0.21	0.41	0.52	**0.85**	
Trust	0.33	0.35	0.18	0.40	0.32	0.35	**0.89**

Note: Conc: concentration, Enj: perceived enjoyment, Sat: satisfaction, Int: intention to continue use, Ac: actual continued usage

4.2 Structural Model Assessment and Hypothesis Testing

A summary of the hypothesis testing is provided in Fig. 2. Our analysis found that concentration, perceived enjoyment, and perceived control positively affected Facebook

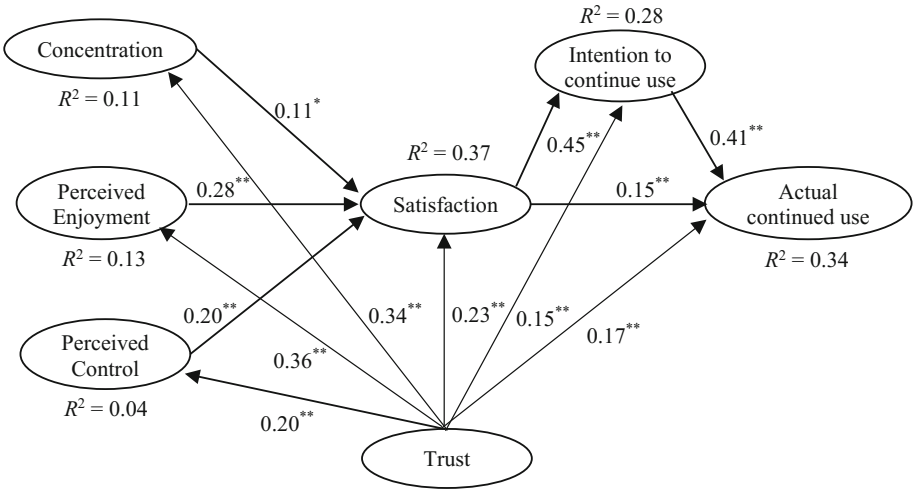

Fig. 2. Structural model - Hypothesis testing ($p^{**} < 0.001$, $p^{*} < 0.05$)

users' satisfaction with the SNS, which supports H1, H2 and H3. Facebook users' satisfaction was positively associated with both intention to visit Facebook continually and actual continued SNS use—thus, H4 is supported. The intention to continuously use Facebook and the actual continued use were shown to be positively associated with each other, which supports H5. Trust in Facebook is significantly associated with all other constructs, thus supporting H6.

Our research findings showed that each construct significantly explains variance-related constructs (see Fig. 2). Most noteworthy, trust in Facebook itself explained 13% of the total variance of perceived enjoyment and 11% of concentration. Satisfaction is explained 37% of the total variance by concentration, perceived enjoyment, and perceived control. Satisfaction and intention to continue use explained 34% of the total variance of actual continued usage. Satisfaction itself also accounts for 28% of the total variance of intention to continue use.

5 Discussion and Implications

By employing trust and the flow theory, we examined factors affecting SNS users' continued use in the context of Facebook. From the flow experience perspective, the hypothesis testing revealed that Facebook users' concentration (H1), perceived enjoyment (H2), and perceived control (H3) are significant predictors of satisfaction. The flow experience originates in intrinsic motivation, with a focus on "the desire to engage in an activity for no other reason than the process of performing it" [33, p. 31]. Therefore, our findings indicate that Facebook users communicate with others via Facebook who want not only the benefits of a Facebook visit, but also the fun and pleasure of communicating with their friends via Facebook activities. Additionally, the positive relationship between satisfaction and perceived enjoyment could be rooted in Facebook functionality itself, which our future research will focus on more. Another

interesting finding of our study is that Facebook users' degrees of concentration and perceived control over Facebook are salient antecedents of their satisfaction with Facebook. These results indicate that Facebook users feel greater satisfaction when they are able to concentrate more on Facebook activities. In other words, other simultaneous activities such as emailing or web surfing may be hindering factors for Facebook users' level of satisfaction. Also, more perceived control during Facebook use leads to a higher level of satisfaction; a more emotionally controlled Facebook environment is more likely to increase Facebook users' level of satisfaction.

The next hypotheses, H4 and H5, linked satisfaction with intention to continue use and actual continued use of Facebook. In fact, actual continuance behavior is still under debate among researchers because such is likely influenced by other behavioral aspects such as habitual usage or automatic response [32]. In our research model, actual continuous behavior is significantly explained by the combination of satisfaction and intention to use. The relationship between satisfaction and intention is noteworthy because satisfaction itself explains Facebook users' intention solely and significantly in terms of a coefficient of determination (R^2). According to our survey's descriptive statistic that 80.4% of respondents have used Facebook for more than 3 years, we claim that satisfaction tends to be derived cumulatively from ongoing communicating activities instead of through temporal or transaction-specific satisfaction [7]. In long-term users, intention still pertains to their actual continuance behaviors, which are impacted by satisfaction.

Lastly, examining H6, trust in Facebook had positive and significant relationships with SNS users' perceptions, behavioral intentions, and actual continuance behavior. Interestingly, our analysis shows that trust explains 11% and 13% of the total variance of concentration and perceived enjoyment, respectively. Our research findings imply that the nature of trust in Facebook can be assessed differently given previous explorations of the root of trust derived from products or services. Trust in Facebook is fundamentally embedded in retaining ongoing relationships through continued use. In other words, the origin of trust in Facebook can be anchored in either (a) a user's friends trusting in Facebook as a safe communication tool or (b) trust of Facebook itself, through which a process of transferring trust from one entity (i.e., friends) to the other (i.e., Facebook) can be made. For further consideration of trust, a post-hoc analysis to examine any influence changes without the existence of trust in Facebook shows that all relationships were still supported positively. In addition, trust in Facebook shows an underlying effect on other relationships among constructs.

While the SNS has emerged as a popular communication medium, and many researchers have conducted SNS studies with varying aspects, this is a pioneer study examining SNS users' continued use of SNSs via flow theory and trust perspectives. This study provides several implications for researchers and practitioners.

First, drawing from flow theory, our study identified that perceived enjoyment, concentration, and perceived control serve as significant antecedents, explaining satisfaction with SNS use and continuous usage behaviors. Among those three constructs, perceived enjoyment is more influential than others, which indicates that a hedonic-oriented aspect is a strong motivator of continuous use of an SNS. Particularly, as prior literature noted [22], our findings also support that satisfaction with SNS use is accounted for by the fact that SNS users tend to filter out or escape any irrelevant

thinking during access. As a result, they are able to entirely pay attention to interacting with other SNS friends, which our findings show motivates SNS users' continuous actual use. Second, our study extends prior adoption and intention studies by exploring flow experience as major antecedents, which differentiates our study from prior studies primarily by employing TRA, TPB, or TAM [13]. Our findings show that the construct of intention plays a salient role, not only as a dependent variable but also in explaining actual behaviors, which aligns with Bhattacherjee et al.'s [4] study in the context of communication IS artifacts. Going one step further than prior studies [4], our research findings indicate that intention for continuous use becomes a significant mediator between satisfaction and actual usage behaviors in the context of SNS. Thus, actual continued use is accounted for by both intention and satisfaction. From a practical perspective, our results imply that the hedonic use of SNSs is still a primary motivational factor in a user's actual continued use of an SNS.

From a practical perspective, according to survey responses, our study implies that hedonic-oriented perception is still dominant when using SNSs. In particular, we found that perceived enjoyment is a key driver for increasing the level of satisfaction. Therefore, SNS service providers' continuous attention to SNS users' flow experience should be important in maintaining SNS sustainability by providing a number of entertaining features. While many SNSs currently implement various features and tools to facilitate communication, such as games or blogs, prior study of flow theory also pointed out that an individual's perceived enjoyment of media usage should be balanced between his or her personal skills and the difficulty of media use, or an individual's feeling about the media's complexity [41]. Otherwise, media users feel bored or anxious if their skills, difficulty using media, or a lack of understanding prevents them from engaging with media, which results in ceasing to use such media. Therefore, SNS service providers may consider potential targets of SNS subscribers, especially if they seek SNS-specific content or features (e.g., virtual collaboration, multimedia contents). Additionally, our research findings emphasize the trustworthiness of SNS, which impacts all perceptions of SNS usage given in our survey responses. High trustworthiness can be achieved not only by implementing solid security countermeasures to prevent accidental exposure of personal information, but also by filtering unwanted information or spam. This would be beneficial to all SNS subscribers because social media spam targets one to one as well as one to many [18]. Furthermore, another report indicates that more than one-third of Facebook employees are fighting against spammers, but the rate of spam feeds such as "like-jacking" is rapidly increasing [18]. It is highly likely that many spam feeds or messages make SNS users inactive and distract from SNS usage.

6 Limitations and Future Research

The limitations of this study are as follows. First, the study participants were college students, thus limiting the scope of media users, even though college-aged students are one of the most experienced Facebook user groups. Also, Facebook is only one social networking site and may not represent all SNSs. Future research with varied groups of SNSs and users might provide distinguished perceptions. Second, the current research

findings have not discussed any potential inverse relationship between trust, satisfaction, and high correlations among constructs related to longitudinal research design. For future research, we suggest identification of any perceptional changes to flow over the period of Facebook usage.

7 Conclusion

The purpose of this study is to examine the salient determinants affecting SNS users' continued usage behaviors by incorporating dimensions from flow theory and the concept of trust after a thorough review of prior literature. Unlike other prior studies, our research model includes the intention to continually use SNS as a mediator between satisfaction and actual SNS use. To test our hypotheses, data was collected from Facebook users who were currently studying at a university, as they were considered representative of the most frequent SNS users. The results of data analysis offer insights that flow experience, represented by concentration, perceived enjoyment, and perceived control—explained significantly the continual use of SNS via satisfaction with SNS use and intention to continue use. More interestingly, our findings suggest that trust plays an important role in explaining other constructs, which represents trust in SNS becoming an overarching perception for SNS usage. Further, our research findings show that SNS users' intention to continue use of an SNS serves as a mediator between the users' satisfaction and actual usage behavior. In conclusion, our research supports the notion that the flow experience serves as an important role in SNS users' continuous use behaviors. While hedonic-oriented constructs are key motivators of actual usage, perceived enjoyment is the strongest factor impacting satisfaction and, eventually, actual continuous SNS usage. It is worth noting that our study contributes a theoretical implication in terms of integrating flow theory and trust as a new perspective of IS users' actual continuance behaviors. More importantly, this study provided evidence that flow theory and its constructs explain sufficiently how IS users' continuance behaviors can be accounted for in the context of communication-based IS artifacts.

Appendix A. Measurement Items

Constructs	Items
Satisfaction	How do you feel about your overall experience of using Facebook? 1. Very dissatisfied – very satisfied 2. Very displeased – very pleased 3. Very frustrated – very contented 4. Absolutely terrible – absolutely delighted
Intention to continue use	1. I intend to continue using Facebook to interact with my friend(s) 2. My intentions are to continue using Facebook rather than any alternative means (e.g., email) 3. I plan to discontinue my use of Facebook. (Reverse coded)

(*continued*)

(*continued*)

Constructs	Items
Actual continued use	1. I use Facebook to interact with my friends very frequently (several times per days) 2. Number of times you currently use Facebook per week? (Choose only one) A. None, B. 1–3, C. 4–6, D. 7–9, E. 10–12, F. Over 12 3. In general, how much time do you spend on Facebook activities per week? (Choose only one) A. 0–5 min, B. 6–15 min, C. 16–60 min, D. Over 60 min
Trust	1. Facebook is a trustworthy social networking site 2. I can count on Facebook to protect my privacy 3. I can count on Facebook to protect personal information from unauthorized use 4. Facebook can be relied upon to keep its promises
Perceived enjoyment	During my last visit to Facebook.com … 1. I found my visit interesting 2. I found my visit enjoyable 3. I found my visit exciting 4. I found my visit fun
Perceived control	During my last visit to Facebook.com … 1. I felt calm 2. I felt in control 3. I felt frustrated (reverse coded)
Concentration	During my last visit to Facebook.com … 1. I was absorbed intensely in the activity 2. My attention was focused on the activity 3. I concentrated fully on the activity 4. I was deeply engrossed in the activity
Facebook usage	How long have you used Facebook? 1. More than 5 years 2. More than 3 years but less than 5 years 3. More than 1 year but less than 3 years 4. More than 6 months but less than 1 year 5. Less than 6 months
Gender	What is your gender? A. Male, B. Female
Age	What is your age? A. 18–22, B. 23–27, C. 28–32, D. 32+

References

1. Agarwal, R., Karahanna, E.: Time flies when you're having fun: cognitive absorption and belief about information technology usage. MIS Q. **24**(4), 665–694 (2000)
2. Agarwal, R., Sambamurthy, V., Stair, R.M.: Cognitive absorption and the adoption of new information technologies. In: The Academy of Management Annual Meetings, Boston, pp. 293–297. Academy of Management (1997)
3. Bhattacherjee, A.: Understanding information systems continuance: an expectation-confirmation model. MIS Q. **25**(3), 351–370 (2001)
4. Bhattacherjee, A., Perols, J., Sanford, C.: Information technology continuance: a theoretic extension and empirical test. J. Comput. Inf. Syst. **49**(1), 17–26 (2008)
5. Boyd, D.M., Ellison, N.B.: Social network sites: definition, history, and scholarship. J. Comput.-Mediat. Commun. **13**(1), 210–230 (2007). https://doi.org/10.1111/j.1083-6101.2007.00393.x
6. Brengman, M., Karimov, F.P.: The effect of web communities on consumers' initial trust in B2C e-commerce website. Manag. Res. Rev. **35**(9), 791–817 (2012)
7. Chang, H.H., Wang, Y.-H., Yang, W.-Y.: The impact of e-service quality, customer satisfaction and loyalty on e-marketing: moderating effect of perceived value. Total Qual. Manag. Bus. Excell. **20**(4), 423–443 (2009). https://doi.org/10.1080/14783360902781923
8. Cheung, C.M.K., Lee, M.K.O.: A theoretical model of intentional social action in online social networks. Decis. Support Syst. **49**(1), 24–30 (2010). https://doi.org/10.1016/j.dss.2009.12.006
9. Chin, W.W.: Issues and opinion on structural equation modeling. MIS Q. **22**, 1 (1998)
10. Chiou, J.S.: The antecedents of consumers' loyalty toward internet service providers. Inf. Manag. **41**(6), 685–695 (2004). https://doi.org/10.1016/j.im.2003.08.006
11. Csikszentmihalyi, M.: Beyond Boredom and Anxiety. Jossey Bass Publishers, San Francisco (1977)
12. Csikszentmihalyi, M.: Flow: The Psychology of Optimal Experience. Harper & Row, New York (1990)
13. Davis, F.D.: Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Q. **13**, 319–340 (1989)
14. Deng, Z., Lu, Y., Wei, K.K., Zhang, J.: Understanding customer satisfaction and loyalty: an empirical study of mobile instant messages in China. Int. J. Inf. Manag. **30**(4), 289–300 (2010). https://doi.org/10.1016/j.ijinfomgt.2009.10.001
15. Eriksson, K., Nilsson, D.: Determinants of the continued use of self-service technology: the case of internet banking. Technovation **27**(4), 159–167 (2007). https://doi.org/10.1016/j.technovation.2006.11.001
16. Fogel, J., Nehmad, E.: Internet social network communities: risk taking, trust, and privacy concerns. Comput. Hum. Behav. **25**(1), 153–160 (2009). https://doi.org/10.1016/j.chb.2008.08.006
17. Foster, M.K., Francescucci, A., West, B.C.: Why users participate in online social networks. Int. J. e-Bus. Manag. **4**(1), 3–19 (2010)
18. Fowler, G.A., Shayndi, R., Efrati, A.: Spam finds new target; Facebook and Twitter build up their defenses as hackers attack social networks. Wall Str. J. (2012)
19. Ghani, J.A., Deshpande, S.P.: Task characteristics and the experience of optimal flow in human-computer interaction. J. Psychol. **128**(4), 381–391 (1994)
20. Hair, J., Joseph, F., Black, W.C., Babin, B.J., Anderson, R.E., Tatham, R.L.: Multivariate Data Analysis. Prentice Hall, Upper Saddle River (2006)

21. Hargittai, E.: Whose space? Differences among users and non-users of social network sites. J. Comput.-Mediat. Commun. **13**(1), 276–297 (2007). https://doi.org/10.1111/j.1083-6101.2007.00396.x
22. Hoffman, D.L., Novak, T.P.: Marketing in hypermedia computer-mediated environments: conceptual foundations. J. Mark. **60**(3), 50–68 (1996)
23. Hsu, C.-L., Lu, H.-P.: Why do people play on-line games? An extended TAM with social influences and flow experience. Inf. Manag. **41**(7), 853–868 (2004). https://doi.org/10.1016/j.im.2003.08.014
24. Jin, B., Park, J.Y., Kim, H.-S.: What makes online community members commit? A social exchange perspective. Behav. Inf. Technol. **29**(6), 587–599 (2010). https://doi.org/10.1080/0144929x.2010.497563
25. Kefi, H., Mlaiki, A., Kalika, M.: Shy people and Facebook continuance of usage: does gender matter? In: The Americas Conference on Information Systems, Lima, Peru, pp. 1–13. AIS Electronic Library (2010)
26. Kock, N.: WarpPLS 5.0 user manual. ScriptWarp Systems, Laredo, April 2015
27. Koufaris, M.: Applying the technology acceptance model and flow theory to online consumer behavior. Inf. Syst. Res. **13**(2), 205–223 (2002)
28. Kwon, O., Wen, Y.: An empirical study of the factors affecting social network service use. Comput. Hum. Behav. **26**(2), 254–263 (2010). https://doi.org/10.1016/j.chb.2009.04.011
29. Lampe, C., Ellison, N., Steinfield, C.: A face(book) in the crowd: social searching vs. social browsing. Paper Presented at the Proceedings of the 2006 20th Anniversary Conference on Computer Supported Cooperative Work, Banff, Alberta, Canada (2006)
30. Li, D., Browne, G.J.: The role of need for cognition and mood in online flow experience. J. Comput. Inf. Syst. **46**(3), 11–17 (2006)
31. Liao, L.F.: Knowledge-sharing in R&D departments: a social power and social exchange theory perspective. Int. J. Hum. Res. Manag. **19**(10), 1881–1895 (2008). https://doi.org/10.1080/09585190802324072
32. Limayem, M., Hirt, S.G., Cheung, C.M.K.: How habit limits the predictive power of intention: the case of information systems continuance. MIS Q. **31**(4), 705–737 (2007)
33. Lu, Y., Zhou, T., Wang, B.: Exploring Chinese users' acceptance of instant messaging using the theory of planned behavior, the technology acceptance model, and the flow theory. Comput. Hum. Behav. **25**(1), 29–39 (2009). https://doi.org/10.1016/j.chb.2008.06.002
34. Miller, R., Parsons, K., Lifer, D.: Students and social networking sites: the posting paradox. Behav. Inf. Technol. **29**(4), 377–382 (2010). https://doi.org/10.1080/01449290903042491
35. Morgan, R.M., Hunt, S.D.: The commitment-trust theory of relationship marketing. J. Mark. **58**(3), 20–38 (1994)
36. Muise, A., Christofides, E., Desmarais, S.: More information than you ever wanted: does Facebook bring out the green-eyed monster of jealousy? CyberPsychol. Behav. **12**(4), 441–444 (2009). https://doi.org/10.1089/cpb.2008.0263
37. Novak, T.P., Hoffman, D.L., Yiu-Fai, Y.: Measuring the customer experience in online environments: a structural modeling approach. Market. Sci. **19**(1), 22 (2000)
38. Oliver, R.L.: Measurement and evaluation of satisfaction processes in retail settings. J. Retail. **57**(3), 25–48 (1981)
39. Riordan, M.A., Kreuz, R.J.: Emotion encoding and interpretation in computer-mediated communication: reasons for use. Comput. Hum. Behav. **26**(6), 1667–1673 (2010). https://doi.org/10.1016/j.chb.2010.06.015
40. Roblyer, M.D., McDaniel, M., Webb, M., Herman, J., Witty, J.V.: Findings on Facebook in higher education: a comparison of college faculty and student uses and perceptions of social networking sites. Internet High. Educ. **13**(3), 134–140 (2010). https://doi.org/10.1016/j.iheduc.2010.03.002

41. Sherry, J.L.: Flow and media enjoyment. Commun. Theory **14**(4), 328–347 (2004). https://doi.org/10.1111/j.1468-2885.2004.tb00318.x
42. Spreng, R.A., MacKenzie, S.B., Olshavsky, R.W.: A reexamination of the determinants of consumer satisfaction. J. Mark. **60**(3), 15–32 (1996)
43. Sproutsocial: 17 Powerful Facebook Stats for Marketers and Advertisers (2016)
44. Steinfield, C., Ellison, N.B., Lampe, C.: Social capital, self-esteem, and use of online social network sites: a longitudinal analysis. J. Appl. Dev. Psychol. **29**(6), 434–445 (2008). https://doi.org/10.1016/j.appdev.2008.07.002
45. Sun, H.: Sellers' trust and continued use of online marketplaces. J. Assoc. Inf. Syst. **11**(4), 182–211 (2010)
46. Trevino, L.K., Webster, J.: Flow in computer-mediated communication: electronic mail and voice mail evaluation and impacts. Commun. Res. **19**(5), 539–573 (1992). https://doi.org/10.1177/009365092019005001
47. Tsai, H.-T., Huang, H.-C., Jaw, Y.-L., Chen, W.-K.: Why on-line customers remain with a particular e-retailer: an integrative model and empirical evidence. Psychol. Mark. **23**(5), 447–464 (2006)
48. Vasalou, A., Joinson, A.N., Courvoisier, D.: Cultural differences, experience with social networks and the nature of "true commitment" in Facebook. Int. J. Hum. Comput. Stud. **68**(10), 719–728 (2010)
49. Webster, J., Trevino, L.K., Ryan, L.: The dimensionality and correlates of flow in human-computer interactions. Comput. Hum. Behav. **9**(4), 411–426 (1993). https://doi.org/10.1016/0747-5632(93)90032-n
50. Wu, J.-J., Chen, Y.-H., Chung, Y.-S.: Trust factors influencing virtual community members: a study of transaction communities. J. Bus. Res. **63**(9–10), 1025–1032 (2010). https://doi.org/10.1016/j.jbusres.2009.03.022
51. Zhephoria: The Top 20 Valuable Facebook Statistics, May 2016
52. Zucker, L.G.: Production of trust: institutional sources of economic structure. Res. Organ. Behav. **8**, 53–112 (1986)