

# The Development and Validation of the Social Network Sites (SNSs) Usage Questionnaire

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**Abstract.** Surfing Social network sites (SNSs) has become one of the most popular activity for ordinary people. To date, there has been no satisfactory measure to understand the role of SNSs in daily life. Considering this, we developed a self-report instrument, the Social Network Sites (SNSs) Usage Questionnaire, which included two subscales for featured usage and affective experience, respectively. Factor analysis suggested 3 factors for the subscale of featured usage and 2 factors for the subscale of affective experience. We referred to the Big Five Personality Inventory and a revised version of the Internet Motivation Questionnaire as external criteria to validate our questionnaire. The results indicated that the newly developed questionnaire is of good psychometric characteristics.

**Keywords:** social network sites (SNSs), affect, personality, motivation.

## 1 Introduction

We would like to draw your attention to the fact that it is not possible to modify a paper in any way, once it has been published. This applies to both the printed book and the online version of the publication. Every detail, including the order of the names of the authors, should be checked before the paper is sent to the Volume Editors. Social network sites (SNSs) are defined as web-based services that allow individuals to construct a public or semi-public profile and share connections with a certain list of other users [1]. Since the first introduction, SNSs, such as MySpace, Facebook, Cyworld (in Korea), Bebo (in Britain) and Renren (in China), have attracted millions of users. For example, Facebook, the world's most popular SNS, has a total number of 1.3 billion monthly active users (Facebook, 2014). According to China Internet Network Information Center (CNNIC), China, holding the world's most numerous Internet users, has an enormous number of SNSs users, specifically, 281 million users in Weibo and 278 million users in other SNSs [2].

In SNSs, people extended real life to communicate their real personality [3], and profiles can be seen as a form of digital body where individuals write themselves into being [1]. Thus, social network sites provide rich sources of naturalistic behavioral data, and offer a good chance to explore people's personality in the cyber world. SNSs also have attracted numerous researchers, especially personality and social

psychologists [4-8]. However, the measures of SNSs usage vary widely. Some of them are lack of reliability and validity, and thus, hard to be used in scientific research. Worse still, most of previous measures ignore the affective experience of SNSs usage. As a result, the primary objective of the present research was to develop and validate a tool for measuring SNSs usage and related affective experience simultaneously.

## 1.1 Extant Measures

In one line of SNSs research, researchers had participants' SNSs pages saved, gathered information from the pages, and developed comprehensive coding schemes to cover virtually all the major items [9-11]. Thus, researchers would collect some quantitative features that are common to standard SNSs profiles, such as number of friends and number of photos. But a lot of features need subjective coding by research raters, which is labor-intensive and results in limited number of participants. What's more, SNSs, like Facebook and Renren, are multi-audience identity production sites, which means users could control over the privacy settings of their accounts and show different identity to different audiences. Researchers could study only one type of users' performance, thus would be blind to other possible shows users presented in their SNSs accounts [10].

In order to obtain a better measure of Facebook usage, Ellison and his colleague (2007) developed the Facebook Intensity Scale [12]. The scale includes two self-reported assessments designed to measure the extent to which participants actively engage in Facebook, and also includes six attitudinal questions designed to tap the extent to which participants are emotionally connected to Facebook and the extent to which Facebook is integrated into their daily practice [12]. Inspired by their work, Ross and his colleagues (2009) developed a Facebook Questionnaire, which contains three categories of items assessing basic use of Facebook, attitudes associated with Facebook, and posting of personally-identifying information [6]. In this 28-item questionnaire, response alternatives range from multiple choice to yes/no depending on the nature of the item, making it hard to analyze; besides, many items turn out to be useless. Afterwards, researchers have only taken part of the Facebook Questionnaire to measure frequency or preferences for particular Facebook features [7, 13]. In addition, since the questionnaire is designed specifically for Facebook, some of the items are not available for other SNSs, for instance, Wang and his colleagues (2012) picked up 5 important features and changed them into a 5-point Likert scale to measure Renren usage [8].

With these measures, a considerable amount of researches have investigated the relationship between personality, particularly, the Five-Factor Model, and the SNSs usage [4, 5, 14]. However, personality defined by the Five-Factor approach may be too broad and not be the most appropriate way to understand specific Internet behaviors [6]. Researchers have also explored other intrapersonal and interpersonal characteristics, such as motivation [15]. However, not much research queried affective results of using SNSs. According to a recent study, the frequency of updating profiles and giving comments are important predictors of subjective well-being (SWB); meanwhile, caring others' comments could be a negative predictor

[16]. However, the SWB could just be an indirect index to show SNSs users' affective experience. As a result, one important objective of the present research was to directly measure SNSs users' affective experience as well as users' behaviors.

## **1.2 Current Study**

In the present study, we took emotions into consideration and designed a new self-report measure of SNSs usage including two subscales, the SNSs Featured Usage Scale and the SNSs Affective Experiences Scale. Instead of only examining one specific site, we generalized features that were common to standard SNSs sites, and expanded the newly developed scale to a wider application. In order to develop more robust indicators of use from the SNSs Usage Questionnaire, for each subscale, a factor analysis was conducted to extract factors, which would yield data cannot be accurately captured by single items. We computed Cronbach's alpha for each factor and correlations among each factor as indexes of internal consistency. To test external validity, we examined the relations between each factor and important personality characteristics, such as the Big Five personality traits and motivations of Internet usage. We hypothesized that motivations and personality could predict SNSs usage tapped by the questionnaire.

## **2 Method**

### **2.1 Participants**

Four hundred and sixty-four participants took part in the study. The sample was composed of 265 females and 199 males, ranging in age from 17 to 25 ( $M = 20.26$ ,  $SD = 1.86$ ).

### **2.2 Materials**

All participants completed the SNSs Usage Questionnaire, a questionnaire for the motivation of Internet usage, a personality inventory, and other tests irrelevant to SNSs. They finished the questionnaires privately, quietly on computer.

The Social Network Sites (SNSs) Usage Questionnaire. The SNSs Usage Questionnaire includes two subscales, the SNSs Featured Usage Scale and the SNSs Affective Experience Scale. At the beginning of the questionnaire, participants were asked to recall the daily usage of one SNS they used most frequently. Based on a questionnaire for Facebook usage [6], we developed the SNSs Featured Usage Scale, which includes 13 items to measure featured usage on SNSs, such as updating one's status and visiting friends' homepages ( $\alpha = 0.82$ ; see the Appendix for the full scale). For 10 items, participants indicated the frequency of their usage of SNSs on 7-point scale (1 = never, 7 = multiple times a day). For the other 3 items, they reported the duration of surfing SNSs each time (1 = less than 15 minutes, 7 = more than four hours), the number of their friends (1 = 1-50, 7 = over 500), and the constitution of their friends (1 = all are friends in real life, 7 = all are strangers in real life).

We also developed an 8-item scale to measure the affective experience of using SNSs ( $\alpha = 0.82$ ), by adapting the Affective Experience Scale [17] and the Positive Affect and Negative Affect Scale [18]. Participants rated the frequency they experience pleasant affects (happiness, contentment, joy, cheer) and unpleasant affects (depression, anxiety, anger, unhappiness) using SNSs on 7-point Likert scale (1 = never, 7 = always).

**Motivation.** According to recent studies, people use SNSs mainly to keep up with friends and families, make new friends, record life, show off, relax, and improve daily life [16, 19]. Hence, we asked the participants to indicate whether they endorse those six motivations on 6-point Likert scale (1 = completely disagree, 6 = completely agree). The internal consistency was acceptable ( $\alpha = 0.69$ ).

**Personality.** We used a 50-item personality inventory for Big-Five factors [20]: agreeableness (e.g. "I can understand the feelings of others", neuroticism (e.g. "I'm moody"), extraversion (e.g. "I am talkative"), conscientiousness (e.g. "I work meticulously"), and openness to experience (e.g. "I am imaginative"). The inventory consists of ten items for each factor and each item was rated on a 6-point Likert scale (1 = strongly disagree, 6 = strongly agree). The internal consistency was good for each of the subscales: agreeableness ( $M = 46.49$ ,  $SD = 5.83$ ,  $\alpha = 0.80$ ), neuroticism ( $M = 25.62$ ,  $SD = 7.59$ ,  $\alpha = 0.82$ ), extraversion ( $M = 35.32$ ,  $SD = 9.01$ ,  $\alpha = 0.85$ ), conscientiousness ( $M = 41.55$ ,  $SD = 7.18$ ,  $\alpha = 0.80$ ), and openness to experience ( $M = 41.43$ ,  $SD = 6.52$ ,  $\alpha = 0.82$ ).

## 3 Results

### 3.1 Dimensionality and Internal Correlations

To develop more nuanced markers of SNSs usage, we carried out a principal component factor analysis with varimax rotation for each subscale (i.e. featured usage and affective experience). We identified three factors from the 13 items of the SNSs Featured Usage Scale (Table 1). According to the content of the items highly loaded on each factor, the three factors represented basic usage (factor I), interactive usage (factor II), and self-display usage (factor III), respectively. The internal consistency of all dimensions was acceptable (0.56 - 0.83). Mean scores were calculated for each dimension (the comp). As for the SNSs Affective Experience scale, the four pleasant affects and the four unpleasant affects, respectively, fell under two factors (Table 2). The internal consistency of each component was high (0.90, 0.85). For each component, we obtained an index by averaging across the four items.

As table 3 shows, the three dimensions of the SNSs Featured Usage Scale (i.e. basic, interactive, and display usage) were significantly correlated with each other ( $r_s > 0.29$ ,  $p_s < .001$ ), and the positive component of the SNSs Affective Experience Scale was negatively related to the negative component ( $r = -0.14$ ,  $p = .002$ ). We also correlated the three dimensions of the SNSs Featured Usage Scale with the two components of the SNSs Affective Experience Scale (Table 3). All the three usage dimensions were modestly associated with positive affects ( $r_s \geq 0.11$ ,  $p_s < .05$ ), whereas only display usage correlated with negative affects ( $r = 0.16$ ,  $p < .001$ ).

**Table 1.** Factor loadings for the SNSs Featured Usage Scale

Item	I	II	III
Frequency of using SNSs	<b>.75</b>	.29	.09
Number of friends	<b>.68</b>	.24	.02
Duration of using SNSs	<b>.53</b>	.09	.51
Making comments	.19	<b>.82</b>	.02
Checking other's comments or messages	.23	<b>.76</b>	.04
Visiting friends' homepage	.23	<b>.71</b>	.03
Sharing or re-send others' profiles	.30	<b>.69</b>	.13
Updating status	.18	<b>.68</b>	.11
Using private message	.06	<b>.51</b>	.27
Updating profile images	.07	.24	<b>.71</b>
Constitution of friends	.08	-.12	<b>.58</b>
Updating photos	.11	.51	<b>.55</b>
Updating notes/blogs	-.33	.45	<b>.47</b>

Note: Highest loading of each item is in boldface.

**Table 2.** Factor loadings for the SNSs Affective Experience Scale

Item	I	II
Joy	<b>.91</b>	-.06
Cheer	<b>.90</b>	-.06
Contentment	<b>.88</b>	-.08
Happy	<b>.83</b>	-.05
Depression	-.10	<b>.84</b>
Angry	-.03	<b>.84</b>
Anxiety	-.04	<b>.84</b>
Unhappy	-.06	<b>.81</b>

Note: Highest loading of each item is in boldface.

**Table 3.** Correlations among dimensions of the SNSs Usage Questionnaire

	Cronbach's $\alpha$	1	2	3	4
1 Basic Usage	0.59				
2 Interact Usage	0.83	.50 <sup>***</sup>			
3 Display Usage	0.56	.29 <sup>***</sup>	.48 <sup>***</sup>		
4 Positive Affects	0.90	.19 <sup>***</sup>	.26 <sup>***</sup>	.11 <sup>*</sup>	
5 Negative Affects	0.85	.02	.03	.16 <sup>***</sup>	-.14 <sup>**</sup>

Note: <sup>\*</sup> $p < .05$ ; <sup>\*\*</sup> $p < .01$ ; <sup>\*\*\*</sup> $p < .001$ .

**Table 4.** Correlations between the motives of Internet usage and the dimensions of the SNSs Usage Questionnaire

Motive	Basic Usage	Interact Usage	Display Usage	Positive Affects	Negative Affects
Contact family and friend	.18***	.23***	.09 <sup>+</sup>	.33***	-.08 <sup>+</sup>
Make new friend	.08 <sup>+</sup>	.16***	.27***	.16***	.06
Relax	.12**	.10*	-.01	.22***	-.19***
Improve daily life	.22***	.15***	.03	.26***	-.13**
Record life	.13**	.28***	.29***	.22***	.01
Show off	.23***	.31***	.33***	.28***	.06

Note: +p < .1; \*p < .05; \*\*p < .01; \*\*\*p < .001.

### 3.2 External Validation

**Motivation and SNSs Usage.** We correlated all the six motivation items with each dimensions of featured usage and affective experience (Table 4). For the featured usage scale, the interactive usage significantly correlated with all the motives ( $r_s \geq 0.10$ ,  $p_s < .05$ ); the basic usage significantly associated with all the motives ( $r_s \geq 0.12$ ,  $p_s < .01$ ) except making new friends ( $r = 0.08$ ,  $p = .098$ ); the display usage significantly correlated with making new friends, recording life, and showing off ( $r_s \geq 0.27$ ,  $p_s < .001$ ). As for the affective experience, positive affects were positively correlated with all the motives ( $r_s \geq 0.16$ ,  $p_s < .001$ ); negative affects, however, only significantly correlated with relaxing and improving daily life ( $r_s \leq -0.13$ ,  $p_s < .01$ ), and marginally associated with contacting families and friends ( $r = -0.08$ ,  $p = .078$ ).

**Table 5.** Multiple regression analyses using gender, age, and the Big Five to predict the dimensions of the SNSs Usage Questionnaire

Motive	Basic Usage	Interact Usage	Display Usage	Positive Affects	Negative Affects
gender	-.05	.07	.06	.03	-.08
age	.11*	-.04	-.05	-.03	-.01
Agreeableness	.08	.08	-.05	.18***	-.09 <sup>+</sup>
Neuroticism	.07	.09 <sup>+</sup>	.05	-.07	.34***
Extraversion	.16***	.20***	.20***	.17***	.02
Consciousness	-.10 <sup>+</sup>	-.03	-.05	.10 <sup>+</sup>	-.16**
Openness	.09	.01	-.07	-.04	-.09 <sup>+</sup>
R <sup>2</sup>	.05*	.04***	.04***	.09***	.21***

Note: +p < .1; \*p < .05; \*\*p < .01; \*\*\*p < .001.

**Personality and SNSs Usage.** For each dimension of featured usage and affective experience, we performed a multiple regression analysis with gender, age, and the five personality factors as the independent variables (Table 5). Among the five personality factors, the three dimensions of featured usage could only be predicted by

extraversion ( $\beta_s \geq .16$ ,  $p_s < .001$ ). Agreeableness and extraversion were both predictors of positive affects ( $\beta_s \geq .17$ ,  $p_s < .001$ ); meanwhile, neuroticism, positively ( $\beta = .34$ ,  $p < .001$ ), and conscientiousness, negatively ( $\beta = -.16$ ,  $p = .002$ ), predicted negative affects.

## 4 Discussion

To understand the role of SNSs in daily life sufficiently, we developed a valid self-report instrument, the Social Network Sites (SNSs) Usage Questionnaire, which included two subscales for featured usage and affective experience, respectively. We introduced factor analysis and distinguished three different featured usages (basic, interactive and display usage) and two affective experiences (positive and negative affects).

For the Featured Usage subscale, different from previous scales examining only one specific site (usually Facebook[6, 12]), we generalized features that were common to standard SNSs sites, and expanded the newly developed scale to a wider application. As expected, the frequency and duration of using SNSs, and the number of friends belong to the basic usage, since they are major indexes of the extent to which the participant actively engages in SNSs [12]. Whereas, constitution of friends belongs to the display factor of SNSs usage, as some researchers lament that friendships in the digital age have somewhat degenerated into a collection of online contacts for others to admire [21]. This could also give an explanation of the high correlation between display factor and the motivation of making new friends. Updating photos and notes (or blogs) had a bit higher factor loadings on the display usage than the interactive usage (0.55 vs. 0.51; 0.47 vs. 0.45). In SNSs, photos and notes are typical means for self-presentation; specially, amongst the various features, the profile image, which is a specific photo and could represent the individual in the online platform, appearing in search results and alongside every turn of online interaction, has been posited as the most important one [10, 22, 23]. Photos displayed on the individual homepage constitute an important way to project the image they wish to present to others [4]. As a result, just like “profile image”, we attributed the items “updating photos” and “updating notes” to the factor of display usage, which also making a higher correlation between display usage and showing off motive. Differently, updating status belongs to the interactive factor, which might because unlike photos, which can be constructed and refined to conceal flaws directly [24], status plays as role of blowing off steam to some degree, and users only update status to gain empathy.

Based on these factors, our study revealed behavioral pattern due to different personality. SNSs users with high extraversion and less consciousness tended to use more SNSs basic usage. Users who scored high on neuroticism and extraversion preferred more frequency of interactive usage. Among the three aspects of personality, extraversion counted the most for predicting the interactive behaviors in SNSs. Those using more display features tended to be less agreeable, and more extraverted. These results were consisted with previous study concerned with the Big

Five personality: the extroverts tended to be more active in the SNSs [4, 5, 14, 16]; conscientious individuals tended to spend less time on SNSs [7], because these sites promote procrastination and serve as distraction from more important tasks [25]; individuals high in neuroticism were more likely to use it for instant messaging [5, 26] and updated profiles more frequently as a means of self-presentation aimed at encouraging the responses of others and thereby creating a sense of belongingness and reducing loneliness [8]. Also, like some of former studies [27, 28], our results failed to reveal the relation between openness to experience and SNS featured usage, this might because SNSs are no longer “a new experience” [28].

As for the Affective Experience Scale, the positive affects and negative affects are exactly represented the originally hypothesized dimensions. Using direct measures, our research furthered former study, which indicated SNSs usage was related to both positive and negative affects [16]. Based on these two factors, the present study also investigated the relations between personality and affective experience in SNSs. Users with high level of agreeableness, extraversion and conscientiousness were more likely to experience positive affects; whereas, negative affects were more likely experienced by users with high neuroticism. Early studies showed an Internet Paradox about computer-mediated communication (CMC). According to Kraut et al.'s (1998) model, the use of the Internet is likely to result in an increase in depression and loneliness, especially for those introverts [29, 30]. Amichai-Hamburger and Ben-Artzi (2003) proposed another model. In terms of this model, for those highly neurotic, increased use of the Internet social services is not a cause, but a result of their loneliness. They also found that for women, loneliness mediates the relationship between neuroticism and Internet use [31].

By combining SNSs featured usage and affective experience, our findings provided a firm proof for the proposition that “both the rich and the poor get richer in the SNSs” [32]. People who scored high on extroversion and narcissism are supposed to have better social skills, and would like to use their advanced social skills to extend their social environment on the internet and use more interactive features; whereas, individuals with high neuroticism, who are supposed to perceived lower level of social support [33], demonstrated a strong interest in using the Internet for communication [26] to avoid loneliness [25] and to make their social needs meet [34], although they still reported plenty of negative experience on SNSs.

## 5 Implications, Limitations and Future Research

We have presented information regarding the development of 2 subscales to measure SNSs usage, including a 13-item Featured Usage Scales, and an 8-item Affective Experience Scale. The scales correlate at predicted levels, and show the similar relations with external variables as previous studies. Different from extant scales, which are unreliable, or of poor validity, or cumbersome in length, we offered our scales as reliable, valid, and efficient assessment for SNSs user's featured usage and affective experience. More importantly, it was the first trial to measure SNSs users'

affective experience directly. And with the combination of behaviors and emotions, we could draw a more complete picture of how SNSs influence daily life.

However, limitation to this study includes lack of comparison with other SNSs questionnaires and examination of the rest-retest reliability. Additionally, personality traits accounted for only a small percentage of the variance in SNS activities, and some of the traits were unrelated to any type of SNS activity in our research. It may be possible that these personality factors do not play a role in directing SNS activities. Further research may extend the present research by examining other intrapersonal or interpersonal characteristics that may have a stronger relationship with SNSs usage, such as narcissism [10, 35] and self-efficacy [11].

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## Appendix: Social Network Sites (SNSs) Usage Questionnaire

Social network sites (SNSs) are defined as web-based services that allow individuals to construct a profile and share connections with a certain list of other users. In SNSs, people can establish their own social networks, design their own homepages, post some personal news, photos, audios, and videos, and so on. Some typical and popular SNSs are MySpace, Facebook, Cyworld (in Korea), Weibo and Renren (in China).

**Table 6.** Part 1. SNSs Featured Usage Scale

Please try to recall the daily usage of one SNSs, and ask the following questions.

1. How frequently do you use SNSs?						
Never 1	Yearly 2	Monthly 3	Weekly 4	Multiple times a week 5	Daily 6	Multiple times a day 7
2. On average, each time you visit SNS, how long would you spend on it?						
15min or less 1	15- 30min 2	0.5-1h 3	1-2h 4	2-3h 5	3-4h 6	More than 4h 7
3. In your favorite SNSs, how many friends do you have?						
1-50 1	50-100 2	100-200 3	200-300 4	300-400 5	400-500 6	More than 500 7
4. In your favorite SNSs, the composition of your friends...						
All acquaintances in reality 1	2	3	Equal 4	5	6	All strangers in reality 7
5. How frequently do you send private message to others?						
Never 1	Yearly 2	Monthly 3	Weekly 4	Multiple times a week 5	Daily 6	Multiple times a day 7
6. How frequently do you update your status?						
Never 1	Yearly 2	Monthly 3	Weekly 4	Multiple times a week 5	Daily 6	Multiple times a day 7

**Table 6.** (continued)

7. How frequently do you write notes/blogs?						
Never 1	Yearly 2	Monthly 3	Weekly 4	Multiple times a week 5	Daily 6	Multiple times a day 7
8. How frequently do you update your profile image?						
Never 1	Yearly 2	Monthly 3	Weekly 4	Multiple times a week 5	Daily 6	Multiple times a day 7
9. How frequently do you post photos?						
Never 1	Yearly 2	Monthly 3	Weekly 4	Multiple times a week 5	Daily 6	Multiple times a day 7
10. How frequently do you share or re-send others' profiles (e.g. notes or photos)?						
Never 1	Yearly 2	Monthly 3	Weekly 4	Multiple times a week 5	Daily 6	Multiple times a day 7
11. How frequently do you visit your friends' homepage?						
Never 1	Yearly 2	Monthly 3	Weekly 4	Multiple times a week 5	Daily 6	Multiple times a day 7
12. How frequently do you comment on others' notes or photos?						
Never 1	Yearly 2	Monthly 3	Weekly 4	Multiple times a week 5	Daily 6	Multiple times a day 7
13. How frequently do you check others' comments or message on your profiles?						
Never 1	Yearly 2	Monthly 3	Weekly 4	Multiple times a week 5	Daily 6	Multiple times a day 7

**Table 7.** Part 2. SNSs Affective Experience Scale

Please indicate how frequently you would experience the following affects when using SNSs (1= never, 7= always).

	Never				Always			
<b>Unhappiness</b>	1	2	3	4	5	6	7	
<b>Happiness</b>	1	2	3	4	5	6	7	
<b>Depression</b>	1	2	3	4	5	6	7	
<b>Joy</b>	1	2	3	4	5	6	7	
<b>Angry</b>	1	2	3	4	5	6	7	
<b>Contentment</b>	1	2	3	4	5	6	7	
<b>Anxiety</b>	1	2	3	4	5	6	7	
<b>Cheer</b>	1	2	3	4	5	6	7	