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Development and validation of the Chinese social media addiction scale

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ABSTRACT

Accumulating evidence has shown that social media addiction is a growing problem in China, especially among emerging adults. Nonetheless, the absence of a psychometrically sound measuring tool obstructs further progress in this field. Therefore, we examined the properties of a newly developed social media addiction scale among a sample of 619 college students. An exploratory factor analysis revealed that the scale had six factors: preference for online social interaction, mood alteration, negative consequence and continued use, compulsive use and withdrawal, salience, and relapse, which explained 63.83% of the total variance. Cronbach's alpha and half-split coefficient of the whole scale were 0.937 and 0.879, respectively. A confirmatory factor analysis indicated that the six-factor model was a good fit to the data. Moreover, the social media addiction scores were positively correlated with smartphone addiction, pathological Internet use, and narcissism, but negatively associated with self-esteem. Our study suggests that the newly developed social media addiction scale could be used as an effective tool to assess social media addiction among emerging adults in China.

1. Introduction

In the past decade, we have witnessed the emergence and explosion of social media, which allows for instant communication, the ability to maintain friendships and interact with friends in real-time, and seeking new acquaintances based on common interests (Ellison, 2007). The use of social media in China is so ubiquitous and popular that people can access it whenever they want. However, such seemingly incessant connection could be problematic due to empirical findings that excessive use could lead to envy, depression, and anxiety (Kross et al., 2013; Marino, Gini, Vieno, & Spada, 2018). Consequently, pathological social media use or addiction to it is a public health concern.

Several screening tools have been explored to assess this evolving issue. Some instruments cater to specific social media platforms, such as the wide spread use of the Bergen Facebook Addiction Scale (Andreassen, Torsheim, Brunborg, & Pallesen, 2012), which has already been extensively adapted to diverse culture backgrounds (Phanasathit, Manwong, Hanprathet, Khumsri, & Yingyeun, 2015; Pontes, Andreassen, & Griffiths, 2016; Salem, Almenaye, & Andreassen, 2016). Others have been constructed based on the Internet gaming disorder criterion, such as the social media disorder scale (van den Eijnden, Lemmens, & Valkenburg, 2016). Moreover, some have been developed by adapting existing Internet addiction scales to social media domains (Assunção & Matos, 2017; Caci, Cardaci, Scrima, & Tabacchi, 2017; Marino, Vieno, Altoè, & Spada, 2016). However, Facebook addiction is not synonymous with social media addiction (Griffiths, 2012, 2013; Kuss & Griffiths, 2011); therefore, a broader platform and psychometrically sound scale is needed to assess this growing problem (Kuss & Griffiths, 2017). Moreover, the dimensions of existing tools vary considerably because these measurements were based on diverse theoretical backgrounds. In addition, the abovementioned tools were typically developed in Western culture, and cross-culture validation of the existing scales is still necessary.

According to the latest released official report from the China Internet Network Information Center (CINIC), there are almost 0.751 billion netizens in China, accounting for 1/5 of the netizens globally (CNNIC, 2017). Of these, 30.3% are aged 20–29 years. The top three most popular used social media cites were Wechat (utilization ratio: 85.5%), QQ (utilization ratio: 67.8%), and Sina Weibo (utilization ratio: 37.1%) (CNNIC, 2017). Wechat is a Chinese multi-purpose messaging, social media, and mobile payment app. It was first released in 2011; by 2018, it was one of the world's largest standalone mobile apps by monthly active users (over 1 billion). Like Wechat, QQ is another well-known social media platform consisting of online social games, music, shopping, micro-blogging, movies, and group and voice chat software, which has a longer history than Wechat. Sina Weibo implements many features from Twitter (i.e., people follow celebrities). Despite the extensive reports of the negative effects of social media use by the media, insufficient research has been conducted in China owing to the lack of reliable tools to gauge this issue. Consequently, we developed and

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validated a scale to measure social media addiction among Chinese college students to bridge this gap.

After an extensive review of extant measurement tools addressing behavior, the Internet, and social media addiction (Griffiths, 2000; Hormes, Kearns, & Timko, 2014; Weinstein & Lejoyeux, 2010; Young, 1998), seven classic dimensions of behavioral addiction were included: compulsive use, withdrawal, negative consequence, mood alteration, salience, tolerance, and relapse. Moreover, another two dimensions were considered. First, recent findings support that "preference for online social interaction" (Caplan, 2003; Casale, Tella, & Fioravanti, 2013; Chung, 2013; Fioravanti, Dèttore, & Casale, 2012; Yu et al., 2017) could also contribute to Internet addiction tendencies (e.g., "online social interactions are more comfortable than face-to-face interactions"). Moreover, a recent study also provided initial evidence that preference for online interactions was positively associated with excessive social media use (Assunção & Matos, 2017; Chittaro & Vianello, 2013). Therefore, we added this dimension to our scale.

Second, we included "continued use." It is noteworthy that many individuals continue to use social media even though they are aware of its negative consequences, which are more likely to be psychosocial than physical in nature. This construct has been incorporated in many Internet addiction surveys. Considering recent evidence that social media addiction shares some similarities with Internet addiction and Internet gaming disorder (Przepiorka & Blachnio, 2016; Sigerson, Li, Cheung, & Cheng, 2017), this dimension was included in this study. The continued use dimension differs from both compulsive use and relapse. Continued use specifically refers to a situation in which an individual is aware of the negative outcome of excessive social media use, but still cannot stop using it. Compulsive use is a subjective feeling that one is eager to use social media without awareness of the negative outcomes. Relapse relates to a situation in which one aims to reduce social media use; however, they are not successful.

In sum, we developed and validated a Chines social media addiction scale to inspire innovative research in this area in China. We expected that the developed scale would have good reliability and validity.

2. Method

2.1. Participants

A convenience sample of 318 (sample 1, men = 59, women = 259, aged 18–25 years, M_{age} = 20.43, SD = 1.538 years) and 301 (sample 2, boys/men = 219, girls/women = 82, aged 16–28 years, M_{age} = 26.92, SD = 1.334 years) was employed. Chinese college students participated in exchange for course credit. Since the sex distribution was unequal, independent *t*-tests were performed to examine possible sex differences: in sample 1, M_{male} = 80.98, SD = 19.92; M_{female} = 77.97, SD = 18.35; $t_{(316)}$ = 1.19, p = .264; and, in sample 2, M_{male} = 78.26, SD = 18.30; M_{female} = 82.08, SD = 14.34; $t_{(299)}$ = 1.71, p = .09. Therefore, there were no sex differences. Everyone had at least half a year of social media use experience. In this study, "social media" specifically refers to these three popular platforms in China. This study was approved by a school research committee. Prior to data collection, formal consent was collected from participants, and a notice explicating the study aims and the assurance that personal data would remain confidential and anonymous was sent to participants.

2.2. Measures

Students in sample 1 completed a paper-and-pencil version of the 58-item draft of the scale, which comprised the 8 dimensions mentioned above. Items per each dimension varied from 5 to 8. Items were borrowed from the Internet Addiction Test, the Facebook Addiction Scale, and the Internet Gaming Disorder Scale (continued use dimension); however, the terms "Internet," "Facebook," and "Internet gaming" were replaced with "social media." Two bilingual experts examined the translation of the items when it was not written in Chinese. All tests were written and administered in Chinese. Another expert was responsible for translating final social media scale items into English for publication purpose. The wording and arrangement of the items was checked prior to administration to avoid any grammar ambiguity, errors, repetition, etc. Items were evaluated on a 5-point Likert scale ranging from (1) *strongly disagree* to (5) *strongly agree*. The draft scale could be finished in approximately 20 min. Sample 2 also completed a paper version of the scale. In addition, other measures were included: the Smartphone Addiction Scale, the Adolescent Pathological Internet Use Scale (APIU), a Self-esteem Scale, and a Narcissistic Personality Questionnaire for convergent and criterion-related validity analyses.

Average daily social network use time was collected since this is a valid index of social media addiction (Huang, 2017). Respondents were asked to indicate how much total time they used social media daily: (1) *< 15 min,* (2) *15–30 min,* (3) *30 min–1 h,* (4) *1–2 h,* (5) *2–3 h,* or (6) *> 3 h*.

The Smartphone Addiction Scale was used to measure cellphone addiction (Kwon et al., 2013). Items were evaluated on a 6-point Likert Scale, ranging from (1) *strongly disagree* to (6) *strongly agree*. Cronbach's alpha was 0.93 in this study.

The APIU was used to assess excessive Internet use (Lei & Yang, 2007). Items were evaluated on a 5-point Likert scale ranging from (1) *strongly disagree* to (5) *strongly agree*. Cronbach's alpha was 0.95 in this study.

Self-esteem was measured using a Chinese adaption of Rosenberger's Self-esteem Scale (Wu, 2008), which comprised ten items. Responses ranged from 1 (*totally disagree*) to 4 (*totally agree*). Items are added to obtain a total score. Cronbach's alpha was 0.78 in this study.

The Narcissistic Personality Questionnaire consisting of 28 items including overt and covert narcissism subscales (20 and 15 items, respectively; 7 shared items) was used to measure narcissism (Zheng & Li, 2005). Items were evaluated on a 5-point Likert scale ranging from (1) *strongly disagree* to (5) *strongly agree*. The wide use of this questionnaire in China and its reliability and validity have been demonstrated (Wang, Jackson, Zhang, & Su, 2012; You, Leung, Lai, & Fu, 2013). Cronbach's alphas for the whole scale and the overt and covert subscales subscale = 0.88, 0.87, and 0.81, respectively.

2.3. Data analyses

Data analyses were performed in two steps. First, an exploratory factor analysis (EFA) was performed with sample 1 data to determine the factor structure of the scale using SPSS 20.0. Then, the structure of the scale was validated with a confirmatory factor analysis (CFA) using AMOS 20.0 software in sample 2.

3. Results

3.1. Scale structure

All items were significantly correlated with total score and retained after the item-total correlation analysis. The Kaiser-Meyer-Olkin measure (0.933) of sample adequacy and Bartlett's Test of Sphericity (χ^2 = 478.16, df = 378, $p < .001$) indicated that the sample was suitable for an EFA. Given that factors were correlated, the principal axis factoring method was used to extract factors. A direct oblimin rotation was adopted. Retention of the factors was based on following criterion: eigenvalues > 1, a visual inspection of the scree plot, explaining at least 3% variance before rotation, factor loading value > 0.5, and including at least 3 items. Items with factor loadings < 0.5 and > 0.4 on two or more factors were deleted. Cronbach's alpha was calculated to estimate internal consistency.

The extracted six factors were clear, identifiable, and easy-to-name.