Social networking sites addiction and adolescent depression: A moderated mediation model of rumination and self-esteem

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ABSTRACT

Recent research has shown that social networking sites (SNS) use is a risk factor for depression, but little research has studied the relation between SNS addiction and depression, and less is known about the mediating and moderating mechanisms underlying this relation. The present study examined whether rumination mediated the relation between SNS addiction and depression, and whether the mediating effect was moderated by self-esteem. Our theoretical model was tested using concurrent data collected from 365 Chinese adolescents. The participants completed the measures of SNS addiction, depression, rumination, and self-esteem. The results indicated that SNS addiction was positively associated with depression. Mediation analysis indicated that rumination mediated the relation between SNS addiction and depression. Moderated mediated analysis further revealed that the path between rumination and depression was stronger for individuals with lower self-esteem than individuals with higher self-esteem. Limitations and implications of this study were discussed.

1. Introduction

Social networking sites (SNS), which allow users to communicate with others in diverse forms, such as updating status, posting comments, sending messages, and viewing the information uploaded by others (Kuss & Griffiths, 2011), are changing the way people connect with each other in recent years. SNS usage is becoming a worldwide phenomenon. However, a large number of studies find that SNS use can undermine individuals' well-being (Okeeffe & Clarke-Pearson, 2011; Sampasa-Kanyinga & Lewis, 2015), such as damaging academic performance and causing interpersonal-relationship conflicts (Griffiths, Kuss, & Demetrovics, 2014). SNS addiction (i.e., problematic and compulsive online social networking) is getting increasing academic attention because it is found to have more adverse impacts than the normal SNS use (Kuss & Griffiths, 2011), and SNS addiction rate is found to be 34% in a previous study (Griffiths, Kuss, & Demetrovics, 2014). Depression can damage individuals' personal relationships, life qualities, and other social functions, and it might even lead people to commit suicide (Maalouf, Atwi, & Brent, 2011). Moreover, depression rate in adolescence is relatively high (Cairns, Yap, Pilkington, & Jorm, 2014), and evidence showed that depressive symptoms in adolescence could predict depression in adulthood (Pine, Cohen, Cohen, & Brook,

1999). Therefore, it is necessary to investigate the relation between adolescent SNS addiction and depression.

It has been suggested that Internet addiction is a form of passive coping, and the addicted users relay on the Internet to escape from their real-life problems and troubling feelings (Caplan, 2002; Tao, 2005). According to the coping style theory, if people cope with their problems negatively, it can lead to decreased well-being (Lazarus & Folkman, 1984). Therefore, it is theoretically reasonable that the SNS addiction (a subtype of Internet addiction) could lead to depression. Numerous empirical studies support the notion. For example, a series of cross-sectional studies find that SNS use is positively related to depression (Feinstein et al., 2013; Nesi & Prinstein, 2015). Diary and experience sampling studies have further confirmed that SNS use could predict depression (Steers, Wickham, & Acitelli, 2014; Verduyn et al., 2015). Although there are a few inconsistent results about the relationship between these SNS use and depression (Jelenchick, Eickhoff, & Moreno, 2013; Kim & Lee, 2011), available evidence is largely in line with the notion that SNS use could lead to depression (Appel, Gerlach, & Crusius, 2016). Given that SNS addiction can cause more severe damage than general SNS use (Griffiths, Kuss, & Demetrovics, 2014), it is reasonable to deduce that SNS addiction could lead to depression.

Given the penetration of the SNS and the severe consequences of

depression, it is of both academic and practical importance to explore the underlying mechanisms in the association with SNS addiction and depression. Prior studies have mainly focused on the mediating effects of envy and social comparison between SNS use and depression (Appel et al., 2016). There is little empirical research about the relation between SNS addiction and depression, less is known about whether certain variables would moderate or mediate the relationship between SNS addiction and depression. Besides, most of the studies related to SNS use and depression are focused on college samples (Appel et al., 2016), yet adolescents should attract more academic attention given their development tasks (Robins & Trzesniewski, 2005) and heavy SNS use (Correa, Hinsley, & De Zuniga, 2010). To fill these gaps, our study constructed a moderated mediation model to test the mediating role of rumination and the moderating role of self-esteem in the relationship between SNS addiction and depression in the Chinese adolescents.

1.1. The mediating role of rumination

Rumination is defined as repetitive thoughts and behaviors on symptoms, causes, and consequence of past personal distress (Nolen-Hoeksema, 1991; Nolen-Hoeksema, 2000). According to the response style theory (Nolen-Hoeksema, 1991), rumination is a maladaptive response style that may exacerbate and prolong negative mood by increasing negative thoughts, hindering problem-solving skills and social interactions (Nolen-Hoeksema, 2000; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Numerous studies have confirmed that rumination could lead to depression. For example, a meta-analysis (Olatunji, Naragongainey, & Wolitzkytaylor, 2013) finds that higher levels of rumination could predict higher levels of depression. A longitudinal research has also confirmed that rumination predicts the onset and maintenance of depression (Wilkinson, Croudace, & Goodyer, 2013).

There are several reasons supporting that SNS addiction could lead to rumination. Firstly, certain built-in features of SNS could facilitate rumination (Feinstein et al., 2013; Locatelli, Kluwe, & Bryant, 2012). For example, it is convenient for the users to share their thoughts on the SNS, and rumination could be reinforced if these shared thoughts gain feedbacks from other users. Secondly, some studies find that certain ways of SNS use could cause the users to ruminate, such as updating negative status (Locatelli et al., 2012) and passive SNS use (Shaw, Timpano, Tran, & Joormann, 2015). Thirdly, in a recent study, Liu et al. (2017) found that mobile phone addiction can cause rumination, and given that mobile phone addiction often coexists with SNS addiction (Salehan & Negahban, 2013), this also supports that SNS addiction can lead to rumination. At last, according to the stress-reactive model of rumination and previous empirical studies, rumination takes place after a stressful event (Nolen-Hoeksema, 1991; Nolen-Hoeksema, 2000). Some studies find that SNS addiction could undermine individuals' offline activities, such as damaging academic performance and interpersonal relationships, these adverse influences would unavoidably lead to adolescent stress (Kuss & Griffiths, 2011), which in turn may lead to rumination. To sum up, it is reasonable to assume that SNS addiction can trigger rumination, and rumination would lead to depression. That is, rumination can mediate the relation between SNS addiction and depression. To date, no prior research has examined the mediating role of rumination in the relation between SNS addiction and depression. Based on the theoretical and empirical grounds, we come up with the following hypothesis:

Hypothesis 1. Rumination would mediate the relation between SNS addiction and depression.

1.2. The moderating role of self-esteem

Although SNS addiction is generally regarded as a risk factor for adolescent depression, adolescents may not be identically susceptible to SNS addiction. Some individual characteristics may moderate the

impact of SNS addiction on adolescent depression, for example, self-esteem.

Self-esteem refers to the affective, or evaluative, component of the self-concept, it signifies how individuals feel about themselves (Leary & Baumeister, 2000). Individuals with high levels of self-esteem show better psychological adjustment such as low negative affect and high positive affect (Orth, Robins, & Widaman, 2012), happiness (Diener & Diener, 1995), and lower levels of depression as well (Sowislo & Orth, 2013). According to the risk-buffering hypothesis, favorable individual characteristics, such as self-esteem, can attenuate the relation between some risk factors and psychological status (Luthar, Crossman, & Small, 2015). Empirical research has supported this hypothesis. For example, it is found that self-esteem moderates the relation between cell-phone addiction and depression (HyunSill & Hyon-jin, 2017), and the relation between smartphone addiction and emotional problems as well (Eunseel, 2017). Besides, it is found that self-esteem moderates the relation between Internet addiction and some negative psychological traits (Zhang et al., 2015). Little research has examined self-esteem as a moderator of the indirect relations between SNS addiction and adolescent depression. Based on the risk-buffering hypothesis and empirical grounds, we propose the following hypothesis:

Hypothesis 2. Self-esteem would buffer the indirect relations between SNS addiction and depression.

1.3. The present study

The current study tested the mechanisms underlying the association between SNS addiction and depression in the Chinese adolescents. Particularly, we established a moderated mediation model to answer the following questions: (a) whether rumination plays a mediating role in the relation between SNS addiction and depression, (b) whether self-esteem buffers the mediating effect of rumination in the association between SNS addiction and depression. The integrated model can address questions about both mediation (i.e., how does SNS addiction associate with depression) and moderation (i.e., for whom is the relation most or least strong). Fig. 1 illustrates the proposed model.

2. Method

2.1. Participants

A total of 365 senior high school students in China (52% of the participants were female adolescents) completed our survey, the survey was designed to collect information including demographic variables, SNS addiction, rumination, depression, and self-esteem. The average age of the participants was 15.96 ($SD_{age} = 0.69$ years, range = 14–18 years).

2.2. Measures

2.2.1. Social networking sites addiction

The Facebook Intrusion Questionnaire (FIQ, Elphinston & Noller, 2011) was adapted in the present study, which consists of 8 items (e.g., "I often think about *social networking sites* when I am not using it"). Each item is rated on a 7-point scale (1 = *never*, 7 = *always*). Higher scores indicate greater social networking sites addiction. The FIQ has been used in the Chinese sample and shows good reliability and validity (Błachnio et al., 2016a, 2016b). In the present study, Cronbach's α for the FIQ was 0.86.

2.2.2. Rumination

Rumination was measured by the Chinese version (Yang, Ling, Xiao, & Yao, 2009) of Ruminative Response Scale (RRS, Nolen-Hoeksema & Morrow, 1991), which consists of 22 items. Participants rated each item on a 4-point scale (1 = *never*, 4 = *always*), with higher scores indicate