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Can Social Networking Sites Alleviate Depression? The Relation between Authentic Online Self-Presentation and Adolescent Depression: a Mediation Model of Perceived Social Support and Rumination

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Abstract Ample evidence suggests that authentic self-presentation enhances personal well-being including reduced depression in the offline context, but it is unclear yet whether depression can be reduced by authentic self-presentation in the social networking sites (SNSs) environment. The present study investigated whether authentic self-presentation would predict reduced depression in the SNSs context. Further, we explored whether perceived social support and rumination would mediate the link between authentic self-presentation on SNSs and depression. A sample of 365 middle school students completed measures regarding demographics, authentic self-presentation on SNSs, depression, perceived social support, and rumination. The results indicated that: (a) authentic self-presentation on SNSs would predict reduced depression; (b) both perceived social support and rumination mediated the association between authentic self-presentation on SNSs and depression in an unparalleled fashion; and (c) perceived social support and rumination sequentially mediated the relation between authentic self-presentation on SNSs and depression. Implications of taking SNSs as an alternative way to detect and alleviate adolescent depression are discussed.

Keywords Social networking sites · Authentic self-presentation · Depression · Perceived social support · Rumination · Sequential mediation

Introduction

Depression has long been a crucial research and therapeutic topic given its grave impacts and worldwide prevalence in adolescents. For example, ample evidence suggests that depression can undermine individuals' life qualities, interpersonal relationships, and it might even cause people to commit suicide (Maalouf et al. 2011). It is found that the occurrence of depression in adolescents is fairly high (Cairns et al. 2014), and depressive symptoms in adolescent could predict depression in adulthood (Pine et al. 1999). Given the literature reviewed above, it would be of great importance to explore any way that might prevent and intervene with adolescent depression.

Social networking sites (SNSs), which allow users to create personal files, interact with their offline or online made friends by updating status, posting comments, sending messages, and viewing the information uploaded by others (Ellison 2007), are redefining the way people interact with each other in the recent years. SNSs use has become a part of daily life for many people. For example, it is reported that Facebook has 1.23 billion active users on a daily basis. In China, there are around 638 million SNSs users (SNSs in refer particular to WeChat Moments and QQ-Zone regarding the finding in the present study, which are the top 2 popular SNSs in China), and adolescents make up a major part of it. Literature regarding the influences of SNSs use on individuals' well-being has gained diverse array of results, which could be divided into two main clusters. On one hand, a cluster of studies suggest that SNSs

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could undermine users' well-being (Feinstein et al. 2013; Nesi and Prinstein 2015; Steers et al. 2014; Verduyn et al. 2015). On the other hand, the other cluster of research indicates that SNSs use could enhance users' well-being instead (Ellison et al. 2007; Grieve and Watkinson 2016; Indian & Grieve 2014; Kim and Lee 2011; Reinecke and Trepte 2014; Valkenburg et al. 2006). Research suggests that it is the way that users employ SNSs matters (Bevan et al. 2014). For example, if people passively use the SNSs, it might damage their well-being (Shaw et al. 2015). In contrast, if people use the SNSs in a more active fashion, such as self-presentation (Grieve and Watkinson 2016), it would positively affect their well-being. Taken together, it is possible that SNSs are in a cycle of "moral panic" common to all new media (Bennett et al. 2008), which often overemphasizes the negative influences that new media may have on individuals' well-being. Previous research may have neglected the positive impacts that SNSs use can have on individuals' well-being such as depression. For example, Przybylski et al. (2017) recently find that only a very small percentage of the general population meet the criteria for Internet gaming disorder, and the associations between Internet gaming disorder and individuals' well-being are mixed.

According to the theory of true self, it is important for individuals to express their authentic self to be acknowledged and validated by others (Rogers 1951). There is methodologically diverse and consistent evidence that authentic self-presentation in the offline context can enhance well-being. For example, some cross-sectional studies indicate that being authentic could predict increased self-esteem, positive emotions, and life satisfaction (Goldman and Kernis 2002; Wood et al. 2008). Diary study also supports the positive relation between being authentic and well-being (Heppner et al. 2008). Besides, studies indicate authenticity can predict decreased depression (Lopez and Rice 2006). Recent research concerning the SNSs environment reveals similar results showing that authentic self-presentation can predict positive psychology outcomes (Grieve and Watkinson 2016; Niu et al. 2015a, b). Further, a recent study indicates that expressing emotions on Facebook could predict reduced depression (Lee et al. 2016). Although it is less clear whether authentic self-presentation on SNSs could reduce depression particularly, the evidence reviewed above combining both the offline and the online context is in line with the notion that authentic self-presentation on SNSs could predict reduced depression. These studies support the direct link between authentic self-presentation on SNSs and adolescent depression. Yet, few studies have examined the mediating mechanisms underlying the relation between authentic self-presentation on SNSs and depression. To fill these gaps, the current study established a theoretical model in which perceived social support and rumination account for the association between self-presentation on SNSs and adolescent depression.

The Mediating Role of Perceived Social Support

The uses and gratifications theory (Katz et al. 1973; Ruggiero 2009) indicates that people use certain technologies such as SNSs to fulfill their psychological needs including relatedness (Raacke and Bonds-Raacke 2008). That is, individuals may use SNSs to satisfy their need for relatedness, which in turn enhance their well-being including reduced depression. To be specific, people may present themselves authentically on SNSs to connect with other people, which could bring benefits such as gaining social support, and in turn could satisfy their need for relatedness, and contribute to their enhanced well-being eventually.

Few studies to date have examined the mediating effect of perceived social support between self-presentation on SNSs and depression. Some studies indirectly support the mediating role of perceived social support. As mentioned above, authentic self-presentation on SNSs could predict perceived social support (Kim and Lee 2011). Besides, some studies indicated that perceived social support on SNSs could predict reduced depression. For instance, recent studies found that perceived social support on Facebook negatively correlated with depression (Frison and Eggermont 2015; Park et al. 2016). Another study demonstrated that using Facebook in an actively way could contribute to perceived social support, and subsequently reduced users' depression level (Frison and Eggermont 2016). Further, it is found that authentic self-presentation on Facebook could predict subjective well-being via perceived social support (Kim and Lee 2011). Similarly, Niu et al. (2015a) found that perceived social support mediated the relation between authentic self-presentation on SNSs and life satisfaction. Besides, Niu et al. (2015b) also found the mediating effect of perceived social support between authentic self-presentation on SNSs and enhanced self-esteem.

Taken together, authentic self-presentation on SNSs is positively related to perceived social support, which in turn is negatively associated with depression. Based on the theoretical and empirical grounds reviewed above, we propose the first hypothesis in the present study:

Hypothesis 1: Perceived social support would mediate the relation between authentic self-presentation on SNSs and depression.

The Mediating Role of Rumination

To our knowledge, few research has tested the relation between authentic self-presentation and rumination neither in the offline nor the online environment, not to mention the mediating effect of rumination between authentic self-presentation on SNSs and depression. Yet, we postulate that the mediating role of rumination is reasonable for the following reasons.

On one hand, although little is known about the relation between authentic self-presentation on SNSs and rumination, it is reasonable to deduce that authentic self-presentation on SNSs could contribute to reduced rumination for several reasons. Rumination is characterized by repetitive thoughts and behaviors on symptoms, causes, and consequences of past personal distress (Nolen-Hoeksema 1991; Nolen-Hoeksema 2000). Firstly, authentic self-presentation on SNSs includes sharing one's experiences, feelings and thoughts by constructing profile, updating status, managing photo album, and so on (Grasmuck et al. 2009; Strano 2008). Unlike positive self-presentation, authentic self-presentation indicates presenting oneself in a true-to-self manner, which means confronting and organizing one's upsetting experiences. Secondly, it is found that expressive writing could reduce depression via the mediating effect of rumination (Gortner et al. 2006). Expressive writing requires the participants to write about their emotionally upsetting experiences, the process of which includes organizing and expressing one's negative experiences, feelings or thoughts. Given that expressing one's negative events, emotions or thoughts plays a big part of authentic self-presentation on SNSs. It is reasonable to say that authentic self-presentation on SNSs are similar with expressive writing both in form and essence, because they all mainly emphasize on organizing and expressing one's emotionally upsetting experiences, feelings or thinking through one's problems actively. Therefore, it is logical to deduce that authentic self-presentation on SNSs could lead to reduced rumination. Thirdly, according to the response style theory (Nolen-Hoeksema 1991), rumination takes place after one perceiving a stressful event. Authentic self-presentation on SNSs often leads to interpersonal interactions, it would let the user's online friends know his/her real situation, which may eliminate or alleviate one's perceived stressful event by bringing care and help from the user's online friends, and in turn reduce his/her rumination level eventually. In addition, unlike expressive writing, authentic self-presentation on SNSs requires no expert guidance and could be practiced on a daily basis with no time or space limits, it is more convenient for the users to conduct it and gain accumulated psychological benefits such as reduced depression.

On the other hand, the causality between rumination and depression has been clearly discussed with abundant evidence. According to the response style theory (Nolen-Hoeksema 1991), rumination is a maladaptive response style that can lead to depression by enhancing negative mood-congruent thinking, damaging instrumental behavior and problem solving, and deterring interpersonal relationships (Nolen-Hoeksema 1991; Nolen-Hoeksema et al. 2008). A large body of research demonstrates that rumination can result in depression. For instance, Nolen-Hoeksema and Morrow (1993) adopted an experimental design, the results of which demonstrate that rumination can lead to increased depression.

Also, a longitudinal design indicates that rumination can predict the onset and maintenance of depression (Wilkinson et al. 2013). Besides, a meta-analysis study further confirms this relation showing that higher levels of rumination predict higher levels of depression (Olatunji et al. 2013). To sum up, it is of both theoretical and solid empirical evidence that rumination can cause depression.

Taken together, authentic self-presentation on SNSs could predict reduced rumination, which in turn could predict decreased depression. Based on the literature reviewed above, we propose the second hypothesis:

Hypothesis 2: Rumination would mediate the relation between authentic self-presentation on SNSs and depression.

A Multiple Mediation Model

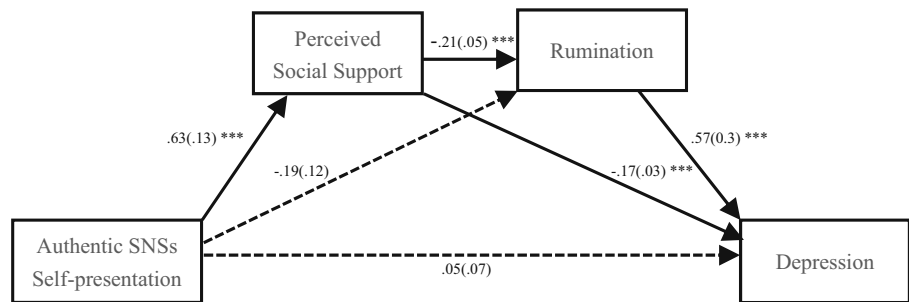
This study examines the mediating roles of both perceived social support and rumination in the association between authentic self-presentation on SNSs and adolescent depression. Compared with a simple mediation model, this integrated multiple mediation can examine the multiple mechanisms from the antecedent variable to the consequent variable simultaneously (Hayes 2013), which can provide more insights about how authentic self-presentation on SNSs is linked to depression.

We know little about how the two mediators work together because of the absence of previous empirical grounds, but several possible mediation models may exist (Liu and Ling 2009). The first possibility is the parallel mediation model. That is, perceived social support is only one of the possible explanations for depression, and rumination is another explanation for depression. Perceived social support and rumination mediate the relation between authentic self-presentation on SNSs and depression in a parallel fashion. The second possibility is the sequential mediation. According to the response style theory (Nolen-Hoeksema 1991), rumination takes place after perceiving a stressful event, and social support from others may help reduce the perceived stressful event in one's mind or even help solve one's stressful events in the real life, so it is reasonable to postulate that perceived social support could contribute to reduced rumination. In this sense, the relation between authentic self-presentation on SNSs and depression would be mediated by perceived social support and rumination sequentially. Nonetheless, we produce a multiple model to examine these possibilities (Fig. 1).

The Present Study

Taken together, the current study aims to uncover three research questions: (a) to examine the mediating role of

Fig. 1 The proposed multiple mediation model. The association between authentic self-presentation on SNSs and depression is mediated by perceived social support and rumination. Path values are the path coefficients (standard errors). *** $p < .001$



perceived social support in the link between authentic self-presentation on SNSs and adolescent depression; (b) to test the mediating effect of rumination in the association between authentic self-presentation and adolescent depression; (c) to confirm how perceived social support and rumination work together in the above pathway. It is important to note that we use the term “mediate” only in the statistical sense, since the cross-sectional design do not approve any causal conclusion.

Methods

Participants

A total of 365 senior high school students (48% of the participants were male adolescents) completed our survey, which was designed to collect information including demographic variables, authentic online self-presentation, depression, perceived social support, and rumination. The average age of the participants was 15.96 years ($SD_{\text{age}} = 0.69$, range = 14–18 years). Regarding the demographics of the participants, 10% of their fathers and 13% of their mothers had a primary school degree or less; 42% of their fathers had and 43% of their mothers had a middle school degree; 23% of their fathers and 21% of their mothers had a high school or technical school degree; 25% of their fathers and 23% of their mothers had a college degree or above.

Measures

Authentic Online Self-Presentation

Authentic self-presentation was measured by the Chinese version (Niu et al. 2015a) of the Honest Self-presentation Scale designed by Kim and Lee (2011) to assess the extent to which participants authentically share their feelings, thoughts, and life events on SNSs (e.g., “I freely reveal negative emotions I feel—for example, sadness, anxiety, or anger”; “I don’t mind writing about bad things that happen to me when I update my status”), which consists of 4 items. Each item was rated on a 7-point scale (1 = *strongly disagree*, 7 = *strongly agree*), with

higher total scores representing higher tendency to present oneself authentically on SNSs. Cronbach’s α for the scale was .72 in this study.

Depression

Depression was measured by the Center for Epidemiological Studies Depression Scale (CES-D, Radloff 1977), which consists of 20 items selected from previous scales of depression. It includes of six components: feelings of guilt and worthlessness; depressed mood; feelings of helplessness and hopelessness; psychomotor retardation; loss of appetite; and sleep disturbance. Respondents indicate how often within the last week they experienced the symptoms on a 4-point scale (1 = “rarely or none of the time”; 2 = “some or little of the time”; 3 = “occasionally or a moderate amount of time”; 4 = “most or all of the time”). The scores for the 20 items are added, with higher scores representing worse conditions on depression. The CES-D has been used in Chinese sample with good reliability and validity (Dwyer et al. 2014). In the present study, Cronbach’s α for the CES-D was .91.

Perceived Social Support

Perceived social support was measured by the Multidimensional Scale of Perceived Social Support (MSPSS) (Zimet et al. 1988), which consists of 12 items. It measures perceived support from three sources including family (e.g., “I get emotional help and support I need from my family”), friends (e.g., “I can count on my friends when things go wrong”), and significant others (e.g., “There is a special person who is around me when am in need”). Each item was rated on a 7-point scale (1 = *strongly disagree*, 7 = *strongly agree*), with higher scores indicating greater perceived social support. In the present study, Cronbach’s α for the MSPSS was .91.

Rumination

Rumination was measured by the Chinese version (Yang et al. 2009) of Ruminative Response Scale (RRS, Nolen-Hoeksema and Morrow 1991), which consists of 22

items. It assess responses to dysphoric mood that are focused on the self (e.g., “I think back to other times I have been depressed”), focused on the symptoms (e.g., “I think about how hard it is to concentrate”), or focused on possible consequences and causes of moods (e.g., “I go away by myself and think about why I feel this way”). Participants rated each item on a four-point scale (1 = *never*, 4 = *always*), with higher scores indicating higher tendency to ruminate. Cronbach’s α for the RRS was .91 in this study.

Procedure

All materials and procedures were approved by the Ethics in Human Research Committee of the first author’s university. The convenience sampling was adopted to select the target school. The data were collected in middle school classrooms in March, 2017. Informed consent was obtained from the teachers and participants. Students in the target classes were invited to participate in the survey anonymously in classrooms. Well-trained psychology postgraduate students administered the survey. The authenticity, independence, and integral nature of all answers are emphasized to the participants. Students were informed that their participation was voluntary and they could terminate the participation anytime they want. Participants received a pen as incentives.

Data Analysis

Data analysis was conducted with SPSS 20.0 in three steps. First, data were analyzed using descriptive statistics and zero-order correlation analysis. Second, Hayes’s (2013) PROCESS macro for SPSS (Model 4) was used to test the mediation effect of perceived social support and rumination separately. Third, Hayes’s (2013) PROCESS for SPSS macro for SPSS (Model 6) was applied to establish a multiple mediation model of perceived social support and rumination in the association between authentic self-presentation and depression, which means all possible paths from authentic self-presentation to depression in Fig. 1 were examined by Model 6. The analyses of Model 4 and Model 6 in PROCESS will reveal direct effects, indirect effects, and bootstrap confidence intervals (CIs) for indirect effects. If CI does not include zero, then the according effect would be significant.

Results

The purposes of the present study were to explore whether rumination and perceived social support would mediate the relation between relation between authentic self-presentation on SNSs and adolescent depression, and how would rumination and perceived social support relate with each other. These research questions were tested in four steps.

Preliminary Analyses

Table 1 provides descriptive statistics and correlations matrix of the study variables. The results of the bivariate correlations are in line with our expectations. To be specific, authentic online self-presentation was negatively associated with depression ($r = -.12, p < .05$). Perceived social support was negatively associated with depression ($r = -.38, p < .001$). Rumination was positively associated with depression ($r = .70, p < .001$). Besides, authentic online self-presentation was positively associated with perceived social support ($r = .25, p < .001$) and negatively associated with rumination ($r = -.14, p < .01$). In addition, perceived social support was negatively associated with rumination ($r = -.26, p < .001$).

The Mediating Role of Perceived Social Support

Model 4 of the PROCESS macro (Hayes 2013) was adopted to test Hypothesis 1, which presumed that perceived social support would mediate the relation between authentic online self-presentation and depression. The results indicated that authentic online self-presentation was positively associated with perceived social support ($b = .63, p < .001$), which in turn was related to depression ($b = -.29, p < .001$). Meanwhile, the residual direct effect was no longer significant ($b = -.06, p > .05$), which means that perceived social support fully mediated the relation between authentic online self-presentation and depression (indirect effect = $-.18$, 95% CI = $-.31$ to $-.10$). Therefore, Hypothesis 1 was supported.

The Mediating Role of Rumination

Similarly, Hypothesis 2 assuming that rumination would mediate the association between authentic online self-presentation and depression was tested. The results indicated that authentic online self-presentation was negatively associated with rumination ($b = -.32, p < .01$), which in turn was related to depression ($b = .62, p < .001$). At the same time, the residual direct effect was no longer significant ($b = -.05, p > .05$), which means that rumination fully mediated the relation between authentic online self-presentation and depression (indirect effect = $-.20$, 95% CI = $-.35$ to $-.05$). Thus, Hypothesis 2 was supported.

The Multiple Mediation Model

The multiple mediation model was established by Model 6 of the PROCESS macro (Hayes 2013). As presented in Table 2 and Fig. 1, some of the pathways were significant. First, the pathway of “*authentic online self-presentation* \rightarrow *perceived social support* \rightarrow *depression*” was significant (indirect effect = $-.11$, 95% CI = $-.19$ to $-.06$). Second, the pathway of

Table 1 Descriptive statistics and correlations for all variables

Variables	M	SD	1	2	3	4
1. Authentic SNSs self-presentation	4.10	1.26	1			
2. Perceived social support	5.37	1.05	.25***	1		
2. Rumination	2.37	.51	-.14**	-.26***	1	
3. Depression	1.99	.50	-.12*	-.38***	.70***	1

N = 365. * *p* < .05. ** *p* < .01. *** *p* < .001

“authentic online self-presentation → rumination → depression” was not significant (indirect effect = $-.11$, 95% CI = $-.25$ to $.04$). Therefore, perceived social support and rumination did not mediate the association between authentic online self-presentation and depression in a parallel fashion. Third, the sequential pathway of “authentic online self-presentation → perceived social support → rumination → depression” was significant (indirect effect = $-.07$, 95% CI = $-.13$ to $-.03$). Hence, authentic online self-presentation was serially associated with perceived social support ($b = .63$, $p < .001$), rumination ($b = -.21$, $p < .001$), and eventually depression ($b = .57$, $p < .001$). The residual direct pathway of “authentic online self-presentation → depression” was not significant anymore ($b = .05$, $p > .05$). Therefore, perceived social support and rumination fully mediated the relation between authentic online self-presentation and depression.

Discussion

The psychological benefits of self-presentation on SNSs have garnered some empirical evidence (Grieve and Watkinson 2016; Niu et al. 2015a, b), however, few research studies have explored the relation between authentic self-presentation on

SNSs and adolescent depression, and little is known about the mediating mechanisms underlying this association. Based on the true self theory (Rogers 1951), the uses and gratifications theory (Ruggiero 2009), and the response style theory (Nolen-Hoeksema 1991), the current study investigated the mediating roles of perceived social support and rumination in the relation between authentic self-presentation on SNSs and adolescent depression. These findings can advance our understanding of the relation between authentic self-presentation on SNSs and adolescent depression and how this association is linked, which could provide insights about how to prevent and intervene adolescent depression. At the same time, these findings challenge the view that the use of new media such as SNSs would invariably lead to adolescent depression.

The Mediating Role of Perceived Social Support

In line with our Hypothesis 1, the present study found that perceived social support mediated the relation between authentic self-presentation on SNSs and depression. This finding is consistent with the uses and gratifications theory and the self-determination theory. These theories suggest that people use certain communication technologies like SNSs to satisfy their need for relatedness, which in turn enhances their well-

Table 2 Testing the pathways of the multiple mediation model

Effect	<i>b</i>	95% CI	
		Lower	Upper
Direct effects			
Authentic SNSs self-presentation → perceived social support	.63***	.38	.86
Authentic SNSs self-presentation → rumination	-.19	-.42	.04
Perceived social support → rumination	-.21***	-.30	-.12
Authentic SNSs self-presentation → depression	.05	-.10	.19
Perceived social support → depression	-.17***	-.23	-.11
Rumination → depression	.57***	.51	.64
Indirect effects			
Authentic SNSs self-presentation → perceived social support → depression	-.11	-.19	-.06
Authentic SNSs self-presentation → rumination → depression	-.11	-.25	.04
Authentic SNSs self-presentation → perceived social support → rumination → depression	-.07	-.13	-.03

N = 365. *** *p* < .001

being such as reduced depression. Although this theoretical views have been supported by numerous previous empirical studies, the current study is the first to support its availability in explaining how self-presentation on SNSs could contribute to enhanced well-being such as decreased depression. Besides, this finding is consistent with previous empirical studies showing that perceived social support mediates the association between authentic self-presentation on SNSs and adolescent well-being (Grieve and Watkinson 2016; Niu et al. 2015a, b). To our knowledge, this is the first study to test the mediating role of perceived social support in the relation between authentic self-presentation on SNSs and adolescent depression. As revealed by the results, being authentic on SNSs could let other people know about the user's real situation, so they could offer concern and help to the user, which in turn could enhance the user's well-being such as depression.

The Mediating Role of Rumination

As predicted in Hypothesis 2, our study indicated that rumination mediated the link between authentic self-presentation on SNSs and adolescent depression. Previous research has shown that rumination could lead to depression (Nolen-Hoeksema and Morrow 1993; Olatunji et al. 2013; Wilkinson et al. 2013), yet no former study has examined the effect of authentic self-presentation on rumination, and little is known about the mediating role of rumination in the link between authentic self-presentation on SNSs and adolescent depression. Consistent with our hypothesis, self-presentation on SNSs could predict reduced rumination, this result coincides with the studies about the effect of expressive writing on rumination, which suggest that expressive writing could effectively contribute to reduced rumination because it help people to actively think through their problems and express their emotive thoughts (Gortner et al. 2006; Sloan et al. 2008). As mentioned in the above sections, authentic self-presentation on SNSs is similar with expressive writing both in form and essence because they all primarily focus on writing about emotionally upsetting experiences and thinking through their problems actively. Unlike expressive writing, authentic self-presentation on SNSs requires no expert guidance, and it is almost costless and has no time or space limits. Besides, given that SNSs are becoming a part of adolescents' daily life globally, authentic self-presentation on SNSs could contribute to reduced depression cumulatively in a worldwide scale.

The Sequential Mediation

At last, our results indicated that perceived social support and rumination mediated the relation between authentic self-presentation on SNSs and adolescent depression in a sequential fashion. To be specific, the impact of authentic self-

presentation on SNSs on adolescent depression was sequentially mediated by perceived social support and rumination, which indicated that adolescent who present themselves on SNSs authentically could perceive sufficient social support, and it can reduce their tendency to ruminate, thereby decreasing the risk of adolescent depression. It is necessary to note that perceived social support played a fully mediation role in the relation between authentic self-presentation and rumination, which indicates the importance to provide adolescent with sufficient social support when they are in need, these perceived social support may be from family members, friends and important others.

Few studies have tested the relation between authentic self-presentation on SNSs and adolescent depression, not to mention the mediating roles of perceived social support and rumination. By integrating the theoretical and empirical grounds together, the present study examined the mediating effects of perceived social support and rumination simultaneously. The integrated multiple mediation can provide a more comprehensive process account of how authentic self-presentation is linked to adolescent depression. These two process jointly illuminate how SNSs could be used as platforms to enhance adolescent well-being such as alleviating adolescent depression.

Implications

Our findings do have meaningful implications for the prevention and intervention of adolescent depression. First, similar with other studies, our findings indicate that authentic self-presentation on SNSs is a protective factor for adolescent depression. Therefore, when it comes to SNSs use, we should encourage adolescents to present themselves authentically since it could enhance their well-being including reduced depression, increased life satisfaction, and enhanced self-esteem (Grieve and Watkinson 2016; Kim and Lee 2011; Niu et al. 2015a, b). Second, although huge investment has been spent on preventing and alleviating the influence of depression. This crucial task is still facing lots of difficulties. One of the major problems is that it is not always easy to find who are depressed due to the limited institution and specialist, especially in the developing countries. And, these who are depressed may not seek help actively (Andersson et al. 2013; Möller-Leimkühler 2002; Parker et al. 2006). According to a recent study (Reece and Danforth 2016), it is already feasible for researchers to identify the social media users who are likely be depressed by analyzing their account content through computer algorithms. Given that SNSs usage has become a worldwide phenomenon and people prefer to present themselves on SNSs more than in the offline context (Grieve and Watkinson 2016), it can be of certain help to identify these in need and provide them with according assistance. Besides, according to our findings, authentic self-presentation on SNSs could predict reduced

adolescent depression, which challenges the view that SNSs use would invariably damage individuals' well-being. Based on these grounds, it is reasonable to say that SNSs could be platforms for both identifying and alleviating people's depression in a global scope. Third, it is found that individuals with lower self-esteem or who do not have sufficient social skills in the offline context tend to use SNSs more than other population (Kuss and Griffiths 2011), previous studies indicate that these people are also at more risk of being depressed, so authentic self-presentation on SNSs may benefit them more. Fourth, previous research reveals that positive self-presentation on SNSs could also predict enhanced well-being of the user (Kim and Lee 2011), but positive self-presentation could create a biased-positive environment, which could lead the other users to social comparison or envy (Appel et al. 2016), and in turn damage the other users' well-being. Therefore, for the good of all, when it comes to self-presentation on SNSs, it is encouraged for the users to present themselves authentically since it does not undermine other people's well-being. In addition, it is necessary to pay attention to the privacy issues when presenting oneself on SNSs. Fifth, considering that perceived social support is an important mechanism via which authentic self-presentation on SNSs influences adolescent depression, it is vital to make sure that adolescents perceive sufficient social support when in need. Sixth, given that rumination also mediates the relation between authentic self-presentation on SNSs and depression, it is important to reduce adolescents' rumination level. Previous research finds that changing emotional response style and negative cognitive style (Cohen et al. 2015; Querstret and Cropley 2013) could alleviate rumination. It is important for the administrators to promote these methods in the middle schools. Finally, our findings indicate that there are multiple mediators in the association between authentic self-presentation on SNSs and depression, interventions that aim at the two mediators synchronously are more likely to be effective than interventions that target any single mediator.

Limitations and Future Directions

Although the present study could shed light on how authentic self-presentation on SNSs is related to adolescent depression via perceived social support and rumination, certain limits do exist in this study. Firstly, the present adopted a convenience sample, which included only the Chinese middle school students, it is not clear whether the results can be generalized to people from other demographic backgrounds, such as age and culture. It is important for future studies to take participants from diverse contexts, so as to confirm the results in the current study. Secondly, as we mentioned above, it is important not to infer any causal conclusion regarding the findings in the present study since we adopted a cross-sectional design. Nonetheless, if a mediation model is based on theoretical

and empirical grounds, cross-sectional mediation does indeed can offer insights about the relations between the study variables. Still, it is necessary to use longitudinal designs or experiments to obtain causal conclusions. Thirdly, the present study collected data by self-report measures, it is better for further studies to employ multi-informant methods to collect more comprehensive information, which could gain more persuasive conclusion. At last, it is possible that certain individual or environmental variables would moderate the relation between authentic self-presentation on SNSs and depression, yet not included in the present study. Future studies could deepen our understanding of the relation between authentic self-presentation on SNSs and adolescent depression by investigating the moderating roles of these factors.

Conclusion

In summary, the present study tested the mediating mechanisms in the relation between self-presentation on SNSs and adolescent depression, which revealed that perceived social support and rumination sequentially mediated these two variables. These present study confirmed that authentic self-presentation on SNSs could be beneficial for reducing adolescent depression in the digital era by establishing a multiple mediation model.

Compliance with Ethical Standards All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Conflict of Interests On behalf of all authors, the corresponding author states that there is no conflict of interest.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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