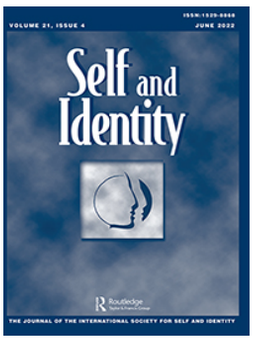

Routledge
Taylor & Francis Group

Self and Identity

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/psai20

Identity lost and found: Self-concept clarity in social network site contexts

Qing Yang, Kees van den Bos, Xiaoying Zhang, Savannah Adams & Oscar Ybarra

To cite this article: Qing Yang, Kees van den Bos, Xiaoying Zhang, Savannah Adams & Oscar Ybarra (2022) Identity lost and found: Self-concept clarity in social network site contexts, Self and Identity, 21:4, 406-429, DOI: 10.1080/15298868.2021.1940270

To link to this article: https://doi.org/10.1080/15298868.2021.1940270

SELF AND IDENTITY
2022, VOL. 21, NO. 4, 406–429
https://doi.org/10.1080/15298868.2021.1940270

Routledge
Taylor & Francis Group

Identity lost and found: Self-concept clarity in social network site contexts

Qing Yang[a], Kees van den Bos[b], Xiaoying Zhang[a], Savannah Adams[c] and Oscar Ybarra[d]

[a]Department of Psychology, Qufu Normal University, Qufu, China; [b]Department of Psychology and School of Law, Utrecht University, Utrecht, Netherlands; [c]Department of Psychology, University of Michigan, Ann Arbor, USA; [d]Department of Business Administration, Gies College of Business, University of Illinois, Champaign, USA

ABSTRACT

Social network sites (SNSs) allow young people to experiment with and present different aspects of themselves during important periods of self-concept development. Interestingly, whether SNSs have negative or positive effects on self-concept clarity (SCC) is inconclusive. We propose that SNS use may simultaneously produce negative and positive effects on SCC, depending on how people use it and the social connection quality created on-line. Specifically, the suppressing mediation model reveals that the direct effect of SNS use intensity on SCC is negative, whereas the indirect effects via perceived social support and self-esteem are positive, suggesting these variables may suppress the negative effect of SNS use on SCC. Our framework helps to explain how SNS contexts influence identity development in young people.

ARTICLE HISTORY
Received 22 June 2020
Accepted 3 June 2021
Published online 20 may 2021

KEYWORDS
Social network site; self-concept clarity; identity; self-esteem; social support

Introduction

A crucial developmental task for adolescents and emerging adults is to build a clear and integrated sense of self and identity (Arnett, 2015; Erikson, 1968). At this life stage, young people are figuring out who they are and what they wish to be. Self-concept clarity matters because it promotes psychological adjustment, including adaptive coping styles such as planning and taking action (Smith et al., 1996), general life satisfaction (Ritchie et al., 2011), and purpose and meaning in life (Błażek & Besta, 2012). Lacking a clear sense of self is associated with maladaptive outcomes such as anxiety and depression (Butzer & Kuiper, 2006), and even schizophrenic symptomology (Cicero, 2017). Given these important ramifications, it is important to investigate factors that can affect the development of self-concept clarity in young people. Our focus in this research is on the important social contexts provided by social network sites (SNSs).

Social contexts play a central role in self and identity formation (Erikson, 1968). Digital media technologies such as SNSs have introduced new social contexts that may heavily influence one's life, raising the question of whether SNSs facilitate or harm the construction of a clear sense of self for young people (Valkenburg & Peter, 2011). This issue has led

CONTACT Qing Yang yq99550@gmail.com Department of Psychology, Qufu Normal University, No.57, JingXuan West Road, Qufu 273165, Shandong, China; Oscar Ybarra oybarra@illinois.edu. Gies College of Business, University of Illinois, 515 East Gregory Drive, Champaign, Illinois 61820, USA.

to some debate. Some evidence has suggested potential harmful effects of SNS use on self-concept clarity (e.g., Appel et al., 2018), while other studies have obtained null (e.g., Valkenburg & Peter, 2008) or even positive effects (e.g., Davis, 2013). Mixed findings reveal the necessity to uncover why SNS use may or may not predict self-concept clarity.

To date, what is missing is a theoretical and empirical account through which these different positive or negative outcomes can be understood. In this study we set out to test a new framework focusing on two potentially suppressing mediational variables: social support and self-esteem. Figure 1 depicts the relationships in our theoretical framework. The depicted *Hypothesized Model* decomposes the total effect of SNS use on self-concept clarity into the direct and indirect paths. Before reviewing the empirical evidence relevant to the different paths in Figure 1, it is useful to briefly discuss the analytic approach we use in this research.

Many regression models take mediators (*M*) into account to explain how a predictor (*X*) affects an outcome of interest (*Y*). Such models are referred to as *consistent mediation models* (Baron & Kenny, 1986), which assume same signs (+ or -) for the direct and mediated (indirect) effects (MacKinnon, 2000). For example, the negative effect of SNS use on self-concept clarity may be decomposed into a negative direct effect, plus a negative indirect effect through social comparison (e.g., Q Liu et al., 2017).

However, while consistent mediation effects explain how *X* predicts *Y*, the inclusion of potential suppression variables (mediators that work in opposite direction to the direct effect of *X*) can elucidate why *X* does not significantly predict *Y* (Ludlow & Klein, 2014; Wen & Ye, 2014). Using a *suppression* model in this research, we seek to clarify the relationship between SNS use and self-concept clarity in light of contradictory evidence regarding its negative and positive effects.

SNS use and self-concept clarity: Hypotheses and mechanisms

Social network sites such as Facebook and WeChat are used worldwide, providing users the opportunity to present themselves to others and establish or maintain social connections (Boyd & Ellison, 2007). In China, WeChat is the most popular SNS with more than 1.1 billion monthly active users, according to the latest data (end of September 2019) released by its developer *Tencent* (https://mp.weixin.qq.com/s/

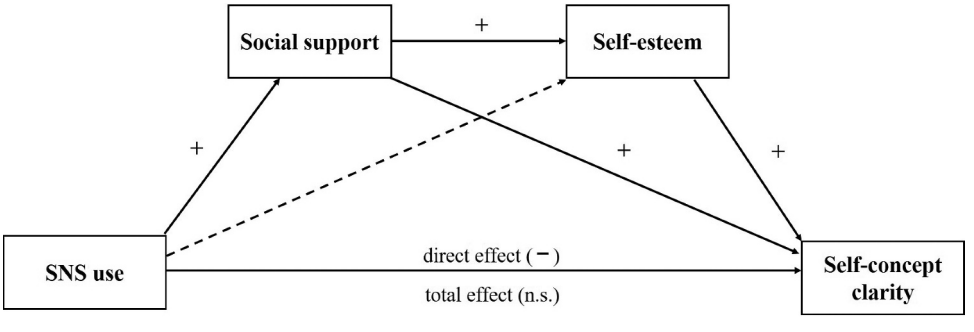

Figure 1. The *suppression* model of SNS use on self-concept clarity (*hypothesized model*), in which the total effect can be null (n.s.) because the two sets of direct (-) and indirect paths (□) are antagonistic.

nwVTqNJMpen7JpJNQKapdw). Like Facebook, the core functions of WeChat include sending messages in different formats (e.g., text, emoji, voice, free video call), posting personal information (e.g., photos, videos) and interacting with others' posts (e.g., "Like" or comment) via the *moments* section. Importantly, "friends" on WeChat are predominately those who already know each other in real life and the primary way to make new friends is when users are in the same chat group. Of the active WeChat users, emerging adults (@ 18–25 years old) make up a large proportion (over 40%).

Emerging adults are at an important stage in identity exploration due to life transitions (e.g., school to university, living with family to independent living) and have many opportunities to explore the self through love, work, and worldviews (Arnett, 2015; Erikson, 1968). SNSs provide opportunities to try different self-presentations, which may increase risk of identity confusion (e.g., "Who am I really?"; Turkle, 1995). Thus, it is important to examine how SNS use is related to the construction of a clear sense of self for young users.

Self-concept clarity (SCC) is defined as "the extent to which the contents of an individual's self-concept (e.g., perceived personal attributes) are clearly and confidently defined, internally consistent, and temporally stable" (Campbell et al., 1996, p. 141). This definition captures the tenet of an Eriksonian view of identity, which emphasizes the coherence and consistency of the view of oneself (Erikson, 1968). In the absence of a clear self-concept, people are likely to experience identity confusion (Schwartz et al., 2017).[1]

Two well-known competing hypotheses address the relationship between SNS use and SCC (see Valkenburg & Peter, 2008, 2011). The *self-concept unity hypothesis* assumes online communication benefits the development of SCC. This may occur due to SNS users interacting with a multitude of individuals who act as an expanded social sounding board that helps corroborate and affirm one's identity. In contrast, the *self-concept fragmentation hypothesis* proposes that online interaction can harm the development of a clear self-concept. SNSs expose users to various people and ideas, which may lead to attempts to craft different identities, fragmenting their personalities. Earlier studies testing these hypotheses highlight important relationships between SCC and different forms of SNS use, but the studies differ in theoretical emphasis as well as their findings.

Specifically, the findings on how SNS use relates to SCC can be categorized into two different yet connected theoretical views. One has focused on how SNS use is associated with SCC (i.e., SNS use→SCC). This research has revealed that greater Facebook use intensity (both concurrently and longitudinally), more general internet use (e.g., time spent online), and more passive SNS use (e.g., viewing or lurking on others' profiles) are correlated with lower SCC (Appel et al., 2018; Lin et al., 2021; Q Liu et al., 2017; Matsuba, 2006).These findings appear to support the *self-concept fragmentation hypothesis*, in that social experiences in cyber space may goad users into presenting multiple selves that may lead to identity confusion. The other perspective has focused on how SCC can predict SNS use (i.e., SCC→SNS use), for example, showing that lower SCC is associated with higher social comparison frequency on Facebook (Lee, 2014), higher presentation of multiple selves online (Fullwood et al., 2016), and internet overuse and addiction (Israelashvili et al., 2012). These findings were interpreted as indicating that individuals with a less stable sense of self tend to engage in more SNS activities (e.g., social comparison online) to clarify who they are.

The relationship between SNS use and SCC is also affected by how SNS use is measured as well as by factors such as whether antecedents or mediators are considered in the researchers' analytic models. For example, measures of online self-presentation were negatively related to SCC while Facebook use intensity was not (Fullwood et al., 2016). Similarly, internet overuse or addiction was negatively correlated with SCC, but this was not the case for the measure of hours spent surfing the internet (Israelashvili et al., 2012). Moreover, Valkenburg and Peter (2008) found the association between frequency of online identity experiments (i.e., pretending to be someone else online) and SCC was nonsignificant when loneliness was set as an antecedent and various online communication partners were included as mediating variables. Likewise, Davis (2013) found online identity exploration (i.e., trying different ways to express oneself) had negative effects on friendship quality, which subsequently predicted lower SCC. But online peer communication with existing friends predicted higher friendship quality, thus aiding higher SCC. Yang and Brown (2016) found that online self-presentation did not directly predict SCC, but could indirectly predict lower SCC through the mediating role of self-reflection. This indirect path was found in a concurrent model, but it was not confirmed with longitudinal data.

Taken together, the findings on SNS use and SCC are mixed and their relationship is rather complicated, particularly for general SNS use (i.e., SNS use intensity). Our main question then is, does general SNS use significantly predict SCC, and if not, why should that be the case? Investigating general SNS use is important because this indicator reflects the extent to which SNS is integrated into one's daily life (e.g., time spent online and having "friends" online) and the emotional connection one has to these tools (e.g., feelings of importance and connectedness to SNS) (Ellison et al., 2007).

One way to address the discrepancies in the relevant research is to divide generic SNS usage into different types (e.g., online peer communication, passive SNS use), as done in some of the above studies (e.g., Davis, 2013; Lin et al., 2021; Q Liu et al., 2017). In the case of Davis (2013) research, for example, it may be that different motivations and reasons for using SNSs (e.g., identity exploration vs. peer communication) may have produced quite different effects on friendship quality, either leading to a reduction or an increase in SCC.

Another solution, which does not preclude examining type of SNS use, is the consideration of *suppressors*, which is our focus in the present research. In this research, we propose a theoretical model indicating that SNS use intensity may simultaneously have both negative and positive effects on SCC depending on how people use SNS sites and on the quality of the social connections they create. In terms of our conceptual framework (Figure 1), the mixed findings of past research may be accommodated to some extent when relevant *suppressor effects* are taken into account. Specifically, SNS use intensity can have a direct, negative effect on SCC due to processes related to identity fragmentation (e.g., Appel et al., 2018), but it may simultaneously have an indirect, positive effect by improving one's social connections and social support (e.g., Davis, 2013).

The role of social support

An important possible function of SNSs is the provision of social support by creating social connections with others (Ellison et al., 2007; Lu & Hampton, 2017). Social support is defined as the provision of various forms of tangible or intangible aid by one's social

network (Cohen & Hoberman, 1983), either through others' actual supportive actions ("enacted social support") or perceptions/beliefs of support from others ("perceived social support") (Barrera, 1986).

SNSs can provide users the chance to solicit support from their entire network through updating their status (Lu & Hampton, 2017), interacting with friends (Seo et al., 2016), and seeking information or advice online (Utz & Breuer, 2017). These processes help build and maintain social connections (e.g., relationships with both strong and weak ties; Grieve et al., 2013) and social capital (e.g., resources accumulated through interpersonal interactions; Ellison et al., 2007), thus contributing to higher feelings of social support (Lin, 2001). Evidence suggests intense usage of WeChat among college students is positively related to reports of both online and offline social support (G Wang et al., 2019), and a recent meta-analysis concluded that generic SNS usage is helpful for informational and emotional social support (D Liu et al., 2018).

The creation of social support has various beneficial effects on psychological adaption and mental health, predicting lower stress, anxiety, and depression, and higher psychological well-being (Chu et al., 2010; Cohen & Wills, 1985). Social support should also be an important factor facilitating the development of the self-concept or identity, especially for young people. Findings have shown, for example, a positive relationship between social support and SCC in a sample of participants ranging in age from 18 to 65 years (Quinones & Kakabadse, 2015).

Identity control theory provides a useful perspective for understanding how social support in the form of meaningful interpersonal/social feedback from important others (e.g., parents, peers) could influence young people's dynamic identity processes (Kerpelman et al., 1997). Specifically, the information gleaned from one's interactions and explicit feedback from important others can be used to create beliefs about how one is perceived and evaluated by others (also see Bollich et al., 2011; Cooley, 1902). When social feedback is meaningful and consistent with one's identity, the identity should be affirmed. Therefore, supportive feedback from important others should help promote SCC in young people.

Consistent with this perspective, researchers (e.g., Para, 2008) further proposed that family support can encourage young individuals to explore their own values, and to form their own sense of identity through internalizing the models provided by parents. Friends can also serve as models and affect young people's important attitudes, decisions, and characteristics, thus aiding the construction of their belief systems. Research has shown that college students and adolescents who reported higher social support from family and friends tended to have higher occupational and relational identity achievements (Berríos-Allison, 2005; Meeus et al., 2002). Additionally, social support from one's relationship with their mother and quality friendships positively predicted adolescents' SCC in both cross-sectional (Davis, 2013) and longitudinal studies (Van Dijk et al., 2014).

Social support also matters because it is likely to reflect one's experience with important group memberships. SNSs can provide users with opportunities to identify with groups in which members share common interests and offer support to each other (Ridings & Gefen, 2004). From a "social cure" perspective, the sense of group membership can be beneficial for mental health, well-being, as well as identity development (Haslam et al., 2018). For example, individuals strongly fused with a group exhibited higher levels of SCC (Besta et al., 2016). One reason this may occur is because when

group-related characteristics are integrated with the self, the activation of group representations can bring to mind other self-aspects, making them easier to access in one's self-judgments, which may also affect the certainty one has regarding their self-beliefs (Besta et al., 2016).

In sum, it is possible that SNS use intensity indirectly affects SCC by influencing social support (i.e., positive indirect effect). Additionally, the possibility of a negative relationship between SNS use intensity and SCC (Appel et al., 2018) may be explained by suppression effects in the overall relationship (i.e., total effect) of SNS use and SCC given the opposing direct and indirect influences.

The combined effects of social support and self-esteem

Social support may also work with self-esteem to augment the relation between SNS use and SCC, since social support and self-esteem are closely related in SNS contexts (Lin et al., 2020). Self-esteem is a general evaluation toward oneself (Rosenberg et al., 1995). According to Sociometer theory, self-esteem can be regarded as a gauge of a person's social support level, as self-esteem fluctuates in response to the quality of one's interpersonal relationships or social connectedness (Leary et al., 1995).[2]

Despite mixed findings regarding the relation of SNS use and self-esteem (Gentile et al., 2012; Gonzales & Hancock, 2011; Tibber et al., 2020; Vogel et al., 2014; see Saiphoo et al., 2020 for a meta-analysis review), research does suggest that SNS use can contribute to self-esteem through the positive role of social support. Shaw and Gant (2004) found that several Internet chat sessions with an anonymous partner could significantly increase perceived social support and self-esteem. A recent study provided direct evidence that social support mediated the relation between active SNS use and self-esteem among Chinese college students (Lin et al., 2020).

In terms of SCC, ample evidence has revealed a strong, positive relationship between self-esteem and SCC (Campbell, 1990; Campbell et al., 1996; Nezlek & Plesko, 2001). While SCC represents the *knowledge* element of the self, self-esteem reflects its *evaluative* dimension (Campbell, 1990). Researchers assume the two components can contribute to their mutual development (Nezlek & Plesko, 2001). That is, people who have generally positive feelings toward themselves tend to have clearer views of who they are. Campbell (1990), for example, found that high (vs. low) self-esteem participants exhibited more consistency and confidence in judging bipolar traits (e.g., cautious/risky), and more temporal stability in trait ratings over a 2-month interval. These findings suggest high self-esteem individuals have greater clarity about who they are regarding personality attributes. Recent research also reveals that a threat to SCC (i.e., thinking about uncertain aspects of life) increased self-esteem striving among Chinese students, so that threatened participants performed better than control participants on a self-esteem related cognitive task (Yang et al., 2019). This suggests that self-esteem is helpful for restoring a clearer sense of who one is.

Tying all of these elements together, self-esteem may be a vehicle through which social support contributes to SCC. For example, Smith and colleagues found mutual, positive correlations ($r = 0.50 \sim 0.70$) among social support, self-esteem and SCC, although they did not directly test a potential mediation model (Smith et al., 1996). In addition, research examining Chinese college students' individual differences in secure attachment type

(stemming from positive interactions and good relationships with parents) found positive associations with SCC through the indirect effect of self-esteem (Wu, 2009).

As noted previously, there are mixed findings on the relation between SNS use and self-esteem (thus the dashed line in Figure 1) (e.g., Gentile et al., 2012; Vogel et al., 2014). Thus, we do not have a specific prediction on the mediation pathway of SNS use→self-esteem→SCC. Our focus is on how self-esteem can work in conjunction with social support to influence the relation between SNS use and SCC.

Given this empirical base, we expect that SNS use intensity can positively predict social support and then self-esteem, which should predict higher SCC in serial mediation. A corollary of this is that social support and self-esteem may operate together to suppress the negative effect of SNS use intensity on SCC.

In summary, the present research examines the proposed *Hypothesized Model* (Figure 1) to explain why SNS use may or may not predict SCC. Obtaining such evidence would provide a new perspective on mixed results reported in the literature concerning the relation between SNS use and SCC. We also test several *alternative models* (see the *Results* section) to determine their efficacy in accounting for the results.

Method

Participants and procedure

Eight hundred and forty-six Chinese undergraduates voluntarily participated in exchange for monetary compensation. The study was based on a convenience sample, and was carried out in accordance with the Declaration of Helsinki and approved by the Human Research Ethics Committee of the first author's institution. After reading and signing the consent form, participants completed demographic questions (e.g., age, gender) and then the main measures. They also completed other questionnaires belonging to a broader research project but separate from the current study. To minimize common method biases, we used an anonymous mode and assured participants that there were no right or wrong answers, encouraging them to respond as honestly as possible (Podsakoff et al., 2003). Twenty-three participants were excluded from the analyses because they did not complete the measures or they reported never using WeChat. This left a total of 823 participants for the analyses (658 women and 161 men [4 participants did not report their gender], mean age = 19.1 years, *SD* = 1.05, range 16–24). According to Arnett (2015), emerging adults are defined as being between 18 and 25 years of age. The sample consisted predominantly of emerging adults (788 participants were between 18 and 24 years old; 35 participants were between 16 and 18 years old[3]).

Measures

SNS use

Since WeChat is the most popular SNS in China, we assessed the intensity of WeChat use as the indicator of SNS use. To measure WeChat use intensity, we adapted the Facebook Intensity Scale (Ellison et al., 2007) with slight wording modifications, such as replacing "Facebook" with "WeChat". The scale includes six items measuring users' emotional attachment to WeChat (e.g., "I feel out of touch when I haven't logged onto WeChat for a while";

scored from 1 "*very strongly disagree*" to 5 "*very strongly agree*"), number of WeChat friends, and amount of time spent daily on WeChat. This scale has been previously validated and used in China (e.g., G Wang et al., 2019). Higher average scores (after standardizing the items) represent higher WeChat usage intensity (Cronbach's α was 0.83).

Social support

We assessed social support with the 12-item Multidimensional Scale of Perceived Social Support (Zimet et al., 1988). This scale measures three dimensions of feelings of support that come from family (e.g., "I get the emotional help and support I need from my family"), friends (e.g., "My friends really try to help me"), and significant others (e.g., "There is a special person who is around when I am in need"), running from 1 "*very strongly disagree*" to 7 "*very strongly agree*". The Chinese version of this measure has been validated by Jiang (2000) and widely used in China (e.g., Che et al., 2014). Higher total scores represent greater feelings of social support (Cronbach's α = 0.90).

Self-esteem

We used the Chinese version of the Rosenberg (1965) Self-Esteem Scale (revised by XD Wang et al., 1999) to measure global self-esteem. This scale has been widely used in the Chinese context (e.g., Q Liu et al., 2017). The scale's ten items are scored from 1 "*strongly disagree*" to 4 "*strongly agree*" (e.g., "On the whole, I am satisfied with myself"). Higher total scores (reverse-scored items were converted) represent greater global self-esteem (Cronbach's α = 0.85).

Self-concept clarity

To assess self-concept clarity, we used the measure developed by Campbell et al. (1996) and subsequently revised by Fang et al. (2012) for the Chinese context. The revised scale has revealed good reliability and validity (e.g., Yang et al., 2019). The 10 items are scored from 1 "*not at all characteristic of me*" to 4 "*entirely characteristic of me*" (e.g., "My beliefs about myself often conflict with one another"). Higher total scores (reverse-scored items were converted) represent higher self-concept clarity (Cronbach's α = 0.85).

Statistical analysis

Structural equation modeling (SEM; performed by Amos 23.0) with maximum likelihood estimation was used to assess the fit of the models and to obtain estimated path coefficients. Model fit was evaluated by using Chi-square(χ^2), Bentler's Comparative-Fit Index (CFI), Tucker-Lewis Fit Index (TLI), Root Mean-Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR). Generally, an acceptable model fit is indicated by CFI and TLI over 0.90, RMSEA below 0.10, and SRMR lower than 0.08 (Steiger, 1990; Wen et al., 2004). The bias-corrected percentile bootstrap method was used to test the significance of mediation effects based on 5000 iterations.

Table 1. Means, standard deviations (*SD*), and correlations between variables.

Variables	*Mean* (*SD*)	1	2	3	4	5	6	7	8	9
1. Gender	0.20 (0.40)	–								
2. Age	19.10 (1.05)	−0.04	–							
3. WeChat use	0.00 (0.74)	−0.12***	0.10**	–						
4. Social support (SS)	63.11 (11.41)	−0.05	−0.19***	0.15***	–					
5. Significant others SS	20.82 (4.31)	−0.07*	−0.18***	0.15***	0.88***	–				
6. Family SS	21.21 (4.79)	−0.02	−0.14***	0.15***	0.83***	0.56***	–			
7. Friends SS	21.08 (4.24)	−0.02	−0.18***	0.08*	0.86***	0.71***	0.53***	–		
8. Self-esteem	28.60 (4.78)	0.11***	−0.19***	0.07	0.46***	0.37***	0.39***	0.41***	–	
9. Self-concept clarity	25.75 (4.92)	0.14***	−0.17***	−0.04	0.35***	0.24***	0.31***	0.33***	0.63***	–

Note: Gender was coded as 0 = female, 1 = male. ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$. N= 823. Please note when calculating the correlations between gender and other variables, N = 819 because 4 participants did not report their gender.

Results

Descriptive statistics and correlational analyses

Descriptive statistics and the correlation matrix for the variables are presented in Table 1. WeChat use was positively correlated with social support. However, WeChat use was not significantly correlated with self-esteem or SCC. The three variables of social support, self-esteem and SCC were positively correlated. Gender and age correlated with self-esteem and SCC, consistent with previous research that suggested age and gender can affect self/identity development in young individuals (e.g., Archer, 1989).

Test of the main model

The SEM was used to test our *Hypothesized Model*, which treats social support and self-esteem as mediators in the relationship between WeChat use and SCC (Figure 1). To improve the model fit in SEM analysis (Wen et al., 2004), social support was treated as a latent construct because it includes three obvious, different facets (i.e., family, friends and others) (Zimet et al., 1988). The other variables were treated as observed variables because previous research has suggested their unidimensional factor structure (Campbell et al., 1996; Ellison et al., 2007; Rosenberg, 1965). Since self-esteem was not significantly correlated with WeChat use, self-esteem itself might not be suitable as a mediator in the relation of WeChat use and SCC. Therefore, for parsimony, as shown in Figure 2 below, the mediated pathway of "WeChat use→self-esteem→self-concept clarity" was dropped from further analysis. In addition, because age and gender are theoretically relevant to SNS use (e.g., women on SNS tend to receive greater social support than do men; Tifferet, 2020), and because they were correlated with some of the main variables, we treated them as covariates and controlled for their effects on the outcome and mediator variables in the model.

The structural model revealed a satisfactory fit to the data: χ^2 = 45.21, df = 12, CFI = 0.98, TLI = 0.95, RMSEA = 0.058 [0.041, 0.077], SRMR = 0.026. As summarized in Table 2 and illustrated in Figure 2, the hypothesized relations are significant. Importantly, bias-corrected bootstrap tests revealed that WeChat use had a negative, direct effect on SCC. But both the indirect effect via social support ("WeChat use→social support→self-concept clarity") and the sequential mediated effect ("WeChat use→social support→self-

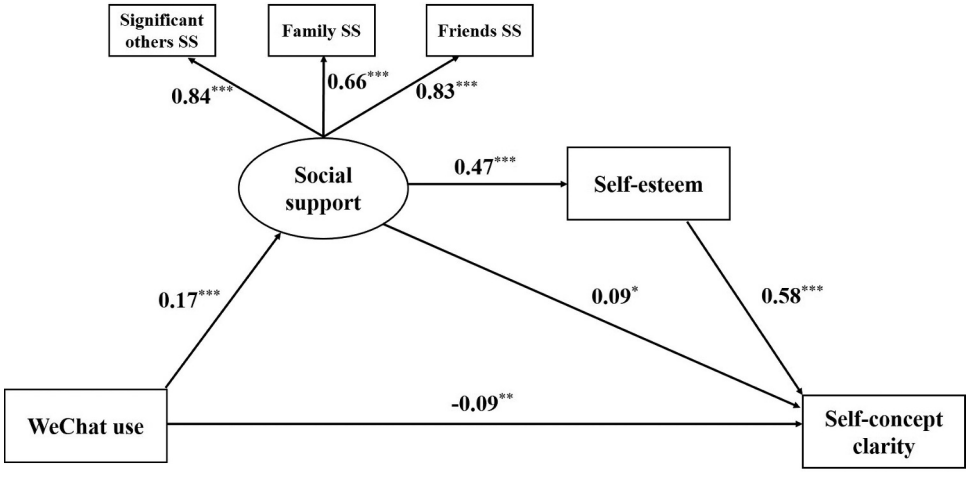

Figure 2. The multiple mediation model on the relationship between wechat use and self-concept clarity. *Note*: Path values are standardized path coefficients (N = 819). The path values for covariates are not shown in the figure for parsimony (relevant statistics for covariates and the other variables are presented in Table 2).

Table 2. Summary of the model paths from the multiple mediation analysis.

Model paths	Standardized Estimate	*p*	95% CI	
			Lower	**Upper**
age→self-concept clarity	−0.03	0.356	−0.09	0.03
age→social support	−0.23	0.000	−0.30	−0.16
age→self-esteem	−0.08	0.014	−0.15	−0.02
gender→self-concept clarity	0.07	0.010	0.01	0.12
gender→social support	−0.04	0.287	−0.12	0.04
gender→self-esteem	0.14	0.000	0.07	0.20
WeChat use→self-concept clarity	−0.09	0.003	−0.15	−0.03
WeChat use→social support	0.17	0.000	0.10	0.23
social support→self-concept clarity	0.09	0.015	0.02	0.15
social support→self-esteem	0.47	0.000	0.41	0.53
self-esteem→self-concept clarity	0.58	0.000	0.52	0.64
WeChat use→social support→self-concept clarity	0.01	0.008	0.01	0.03
WeChat use→social support→self-esteem→self-concept clarity	0.05	0.000	0.03	0.07

Note:95% CI = 95% confidence interval. Gender was coded as 0 = female, 1 = male.

esteem→self-concept clarity") were positive and significant. The opposing aspects of the direct and indirect effects likely made the total effect of WeChat use on SCC not significant (total effect = −0.03, p = 0.399, CI = −0.09 to 0.04). Furthermore, the sequential mediation pathway had a larger effect than the sole mediator pathway (effect difference = 0.03, p < 0.001, CI = 0.01 to 0.06). Generally, the results support the view that social support and self-esteem serially suppressed the negative effect of WeChat use on SCC. For the covariates, age was negatively correlated with social support and self-esteem (but not SCC). Gender was significantly associated with SCC and self-esteem (and not social support), indicating that male participants showed higher levels of SCC and self-esteem than female participants.

Since our sample consisted predominately of women (about 3/4), we checked whether the main results were reliable with only female participants. This SEM revealed

adequate goodness-of-fit indices: χ^2 = 25.54, *df* = 7, CFI = 0.99, TLI = 0.97, RMSEA = 0.063 [0.038, 0.091], SRMR = 0.029. Again, the main findings held: the negative, direct effect of WeChat use on SCC was significant (direct effect = −0.09, p = 0.009, CI = −0.15 to −0.02); the indirect effects via social support (indirect effect = 0.01, p = 0.012, CI = 0.01 to 0.03) and sequential mediators (indirect effect = 0.04, p = 0.002, CI = 0.01 to 0.06) were also significant. We also tested whether gender or age moderated the effect of SNS use on the outcome (i.e., SCC) or mediator variables (i.e., social support) in the *Hypothesized Model*. Results did not reveal any significant interaction effects.

Overall, our hypothesized *suppression* (or *inconsistent mediation*) model was supported by the analyses.

Testing of alternative models

Although we have proposed a *suppression* model to explain the effect of SNS use on SCC through the two mediators of social support and self-esteem, there might be other models that can also explain the unspecified relation between SNS use and SCC. For

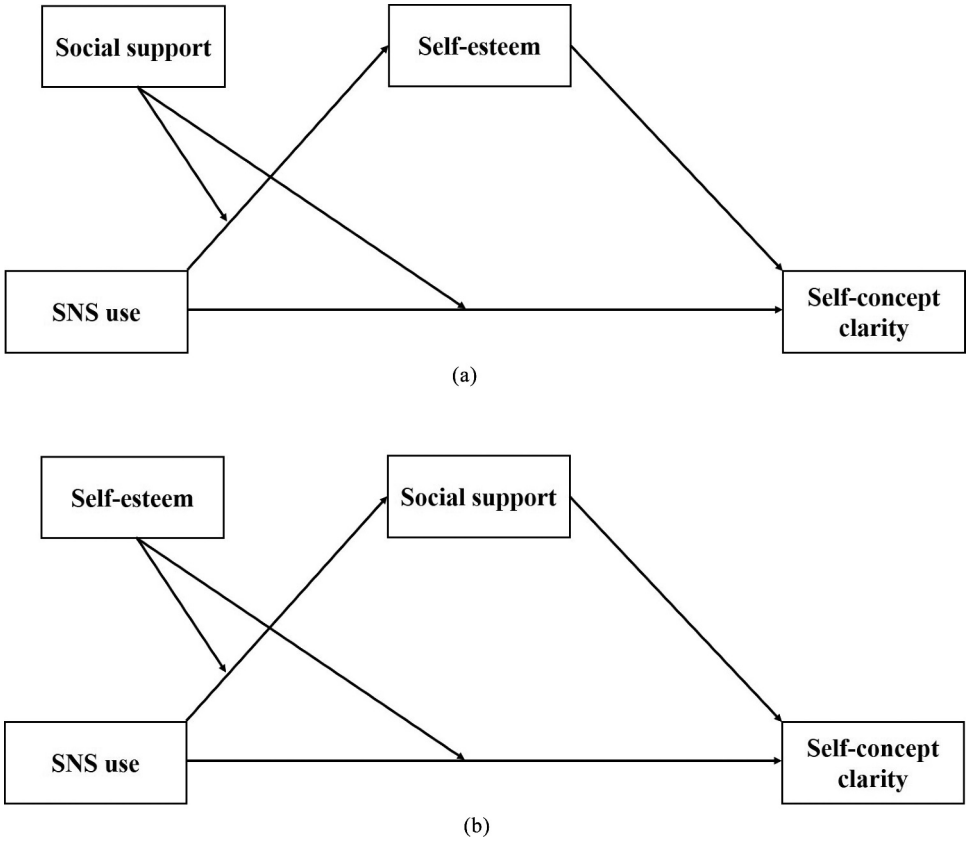

Figure 3. Illustration of two alternative models: (A) Social support as a moderator; and (B) Self-esteem as a moderator.

example, social support or self-esteem may function as moderators. Based on previous research, it is important to consider two alternative models. As depicted in Figure 3, in *Alternative Model A*, social support is treated as a moderator, and self-esteem as a mediator; while in *Alternative Model B*, self-esteem is set as a moderator, and social support as a mediator.

Regarding *Alternative Model A*, social support may moderate the links among SNS use, self-esteem and SCC. Individuals who possess higher supportive feelings may have a stronger social interaction motive and tend to use SNS for communication-related activities (G Wang et al., 2019), which may help create higher quality interpersonal interactions and meaningful social feedback. As mentioned earlier, these positive interpersonal experiences should benefit self-esteem (Leary et al., 1995), as well as SCC (Kerpelman et al., 1997). But for low social support individuals, their social interaction motive can be weaker and may involve more non-communicative use of SNS (e.g., just lurking online) (G Wang et al., 2019). This may reduce social integration (Weiser, 2001) and induce more frequent social comparisons (Verduyn et al., 2017), leading to detrimental effects on self-esteem and SCC (Q Liu et al., 2017; Van Dijk et al., 2014). Therefore, SNS use may produce different effects on SCC (through self-esteem) for high and low social support individuals.

We used SEM to test this possibility (with age and gender as covariates for the mediator and outcome variables), $\chi^2 = 71.11$, $df = 31$, CFI = 0.99, TLI = 0.97, RMSEA = 0.040 [0.028, 0.052], SRMR = 0.024. However, the interaction effect of social support×WeChat use on self-esteem was not significant, $\beta = 0.05$, $p = 0.209$, CI = −0.03 to 0.12; the interaction effect on SCC was also not significant, $\beta = 0.02$, $p = 0.545$, CI = −0.05 to 0.09. Moreover, when we examined whether gender or age moderated the effect of SNS use on the outcome or mediator variables in *Alternative Model A*, the results did not reveal any significant interaction effects.

Alternative Model B treats self-esteem as a moderator on the relations among SNS use, social support and SCC. This can occur because level of self-esteem serves as a personal context in which people experience SNS usage and a lens through which they interpret such experiences. Individuals with high self-esteem may be more likely to seek positive social feedback online (Valkenburg et al., 2006; JL Wang et al., 2012), and are more willing to accept others' support to thrive (Cohen & Wills, 1985). Moreover, individuals high in self-esteem should be more likely to use SNSs in ways that validate their positive self-views and affirm who they are (e.g., posting attractive selfies). So, it is possible that more SNS use is related to higher levels of social support and SCC for high self-esteem individuals. But for individuals low in self-esteem, because they feel anxious about being accepted by others and tend to misinterpret others' support as validation of their weaknesses (Murray et al., 1998), SNSs may be less beneficial for building quality interpersonal relationships and gaining social support. Additionally, individuals low in self-esteem are more likely to make (upward) social comparisons online (Lee, 2014) and are more sensitive to social comparison information (Campbell, 1990), which are both related to lower levels of SCC (Butzer & Kuiper, 2006; Q Liu et al., 2017). It thus seems reasonable to consider that low (vs. high) self-esteem individuals may experience less (vs. more) clarity of self-concept from SNS use, which could also account for the unspecified relationship between SNS use and SCC.

Again, SEM was performed to test this possibility (with age and gender as covariates), $\chi^2 = 46.46$, $df = 15$, CFI = 0.98, TLI = 0.95, RMSEA = 0.051 [0.035, 0.068], SRMR = 0.024. However, the self-esteem×WeChat use interaction produced no significant effects for social support, $\beta = -0.02$, $p = 0.495$, CI = −0.10 to 0.05; or SCC, $\beta = -0.01$, $p = 0.635$, CI = −0.07 to 0.05. Likewise, gender and age did not show any moderation effects in *Alternative Model B* as they did not produce any significant interaction effects.

In terms of the two alternative models above, it appears that social support and self-esteem do not robustly moderate the relationship between SNS use and SCC in our data. Treating them as serial mediators instead helps to better explain the effect of SNS use on SCC.

An interesting third and related question is whether a person's trait-like SCC (e.g., some people tend to have a clear sense of themselves across situations) may influence some important self-processes (e.g., self-esteem maintenance) associated with SNS use. Based on our current findings, we examine whether the effect of SNS use on self-esteem (through the mediating role of social support) may differ for individuals with high and low SCC (see *Alternative Model C* in Figure 4).

The rationale is as follows: For individuals high in SCC who have clear knowledge about their needs and purposes, SNSs can serve as effective tools for building and maintaining high quality interpersonal relationships and social connectedness, which translate into positive experiences of social support and then self-esteem, as suggested by Sociometer theory (Leary et al., 1995). For low SCC individuals who have unstable and uncertain knowledge about their self-views, SNSs may serve as a tool for self-clarity exploration (Israelashvili et al., 2012), but a fragmented self-concept likely impedes adaptive social interactions and relationship building due to anxiety about disclosing a fractured self-concept to others (Emery et al., 2018; Tajmirriyahi & Ickes, 2020). Further, lower SCC has been found to be related to problematic SNS use (e.g., SNS addiction and overuse) (Israelashvili et al., 2012; Quinones & Kakabadse, 2015), which was related to lower perceived social support and self-esteem (Caplan, 2002). Consequently, more SNS use may hardly produce positive outcomes on social support and self-esteem for low SCC individuals.

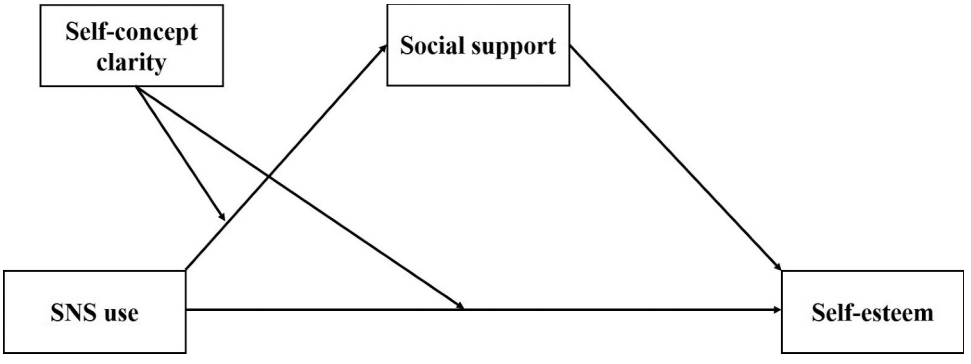

Figure 4. Illustration of alternative model C: self-concept clarity potentially moderating the links among SNS use, social support and self-esteem.

We thus tested these possibilities with SEM (controlling for age and gender), $\chi^2 = 49.86$, $df = 15$, CFI = 0.98, TLI = 0. 95, RMSEA = 0.053 [0.037, 0.070], SRMR = 0.025. The results did not reveal significant interaction effects of SNS use×SCC on social support ($\beta = -0.01$, $p = 0.905$, CI = −0.07 to 0.06) or self-esteem ($\beta = -0.01$, $p = 0.798$, CI = −0.07 to 0.06). In addition, treating gender or age as potential moderators did not reveal any significant interaction effects. Therefore, the assumption that SCC may moderate the associations among SNS use, social support, and self-esteem is not empirically supported in the current data set.

Discussion

Establishing a clear view of oneself (e.g., values, goals, beliefs, etc.) has significant benefits for psychological adjustment (e.g., adaptive coping styles; Smith et al., 1996) and well-being (e.g., lower risks of anxiety, depression and schizophrenia) (Butzer & Kuiper, 2006; Cicero, 2017). As emerging adults start grappling with multiple life transitions (e.g., from school to university and to work; from transient dating to serious consideration of marriage), their evolving roles and others' expectations can result in reductions in self-concept clarity (SCC) (Arnett, 2015; Lodi-Smith & Crocetti, 2017). Considering that self-development is intertwined with the social environment one lives in (Erikson, 1968), and that young individuals now consistently inhabit a digital world, the use of SNSs may impact the formation of SCC in emerging adults.

Over a decade Valkenburg and Peter (2008, 2011) observed that research on the relationship between SNS use and SCC was sparse and inconclusive. Over the past decade, although much more research has probed this issue, the question of whether SNSs facilitate or harm self-concept development still remains due to mixed evidence. To explain the complex findings, we proposed a new framework that suggests that SNS use may simultaneously have negative and positive effects on SCC depending on how it is utilized and whether it is used for the building and maintenance of quality social connections. The current findings may contribute important insights to this emerging body of literature.

First, our results indicate that SNS use intensity has a small direct, negative effect on SCC, consistent with Appel et al.'s (2018) research which found that Facebook intensity predicted decline in SCC over a three-month period. Higher daily SNS users might be more likely to develop different online relationships and receive diverse ideas from others, which may produce various identities and cast doubt on one's core self, as suggested by the *self-concept fragmentation hypothesis* (Valkenburg & Peter, 2011). Moreover, more active daily SNS users may also try more online identity experiments (i.e., pretend to be someone else when being online; Valkenburg et al., 2005), because online social communities are usually separate from those in real life and have fewer offline social repercussions (Turkle, 1995). As a result, online identity experiments can bring more risks of user personality fragmentation and make it more difficult to sustain a unified self-concept.

Second, it should be noted that the overall relationship (bivariate correlation) of SNS use intensity and SCC was not significant, which is consistent with the correlational findings obtained by Fullwood et al. (2016) and Israelashvili et al. (2012). We assume this might be because the direct and indirect effects of SNS use intensity on SCC are antagonistic, thus suppressing the total effect (cf. Ludlow & Klein, 2014). Consistent with

previous research, we showed that SNS use predicts higher SCC when people use the tool for creating support relationships (Davis, 2013). Compared to previous research that used *consistent mediation* models (e.g., Davis, 2013; Valkenburg & Peter, 2008), our *inconsistent mediation* design provides a novel way for understanding why SNS use may at times fail to predict SCC.

Factors that may facilitate the development of self-concept clarity in SNS contexts

Our results indicate that social support and self-esteem may influence the effect of SNS use intensity on SCC through mediating pathways. One general way to think about this is that SNSs such as WeChat can have both positive and negative effects depending on a host of factors (Kross et al., 2021; Verduyn et al., 2017). What our research suggests is that these opposing effects can occur concurrently, but longitudinal research is needed to determine which effect would predominate in the self-development process.

SNSs provide users ample opportunities to strengthen social connectedness and build social capital that can result in socially supportive interactions and relationships (Ellison et al., 2007; Lu & Hampton, 2017). Consistent with previous research (e.g., G Wang et al., 2019), we found a significant positive association between SNS use intensity and social support. For emerging adults, transitioning to college can disrupt existing social bonds (Srivastava et al., 2009). But it is also possible that SNSs such as Facebook and WeChat can be a convenient tool for connecting with family and friends to rebuild social support networks, gain positive social feedback, and obtain a sense of belonging during this developmental stage. In turn, the quality of interpersonal relationships with important others contributes to self-development because such relationships affect young people's important attitudes and decisions, influencing their own values and belief systems (Para, 2008), and further aiding increased coherence of their self-concept (Van Dijk et al., 2014).

Self-esteem also appears to suppress the negative effect of SNS use on SCC. Previous research has revealed a mixed picture of the association between SNS use and self-esteem. SNSs may increase self-esteem when users receive positive feedback (Gentile et al., 2012; Gonzales & Hancock, 2011), but decrease it when they receive negative feedback or make upward social comparisons (Valkenburg et al., 2006; Vogel et al., 2014). Our zero-order correlations revealed a positive but not statistically significant link between SNS use intensity and self-esteem. We emphasize that SNS use should better predict self-esteem through the positive mediating role of social support (Lin et al., 2020). Our findings confirmed this, showing that social support and self-esteem work together to predict a clearer self-concept.

Combined with the finding that the sequential mediating pathway ("WeChat use→social support→self-esteem→self-concept clarity") appeared more efficacious in modeling the prediction of SCC than the other indirect pathways, we argue that self-esteem can suppress the negative effect of SNS usage on SCC *under the precondition* that SNS users feel socially supported by their online connections. If one does not feel supported, SNSs should be less likely to increase self-esteem, precluding the positive effect on SCC. Thus, social support and self-esteem may not work in isolation in SNS contexts, but may be inherently related to each other as suggested by Sociometer theory (Leary et al., 1995). Our integrated, multiple mediation model provides a more comprehensive process

account of how SNS use predicts SCC, and how this negative effect is suppressed by social support and self-esteem.

Implications and future directions

Many environments in which people gather and where various social dynamics emerge create opportunities for both positive and negative consequences, and for some individuals even more of one than the other. Our findings indicate that SNS use per se is not necessarily problematic, it is in the way users engage with the technology (see also Kross et al., 2021al.,). For example, a person could log on to a SNS and simply lurk without building social relationships, which can result in greater social comparison and negative well-being (Kross et al., 2013). But another person who uses SNSs to create high quality social connections may, with time, create a supportive social network that serves as a resource that buffers them from negative SNS dynamics (Verduyn et al., 2017). Hence, whether SNS usage harms or benefits the development of the self-concept depends on users' motivations for using SNSs and how they are used.

It is worth noting that the present research focused on generic SNS usage (i.e., use intensity), but did not specify which function of SNSs was more relevant to identity formation. Social media (e.g., Facebook, WeChat) can serve different functions, such as searching for information (exploratory function), interacting with "friends" (interpersonal function), doing things for entertainment (hedonic function), and sharing personalized information with others (symbolic function; e.g., to share one's creativity with others), etc. (cf. Ridings & Gefen, 2004; Zawadzka et al., 2018). Different social media functions could have different implications for identity formation. For example, while the interpersonal function of media use (e.g., connection with friends) was found to positively predict activism (Tang & Lee, 2013), the hedonic function of media use (e.g., doing things for entertainment) was negatively linked to users' activism identity (Zawadzka et al., 2018).

Differences in these functions may also hinge upon whether users actively or passively use the platform. Studies suggest that active SNS usage (e.g., update status) might be more closely related to social support (D Liu et al., 2018) and self-esteem (Liu & Baumeister, 2016) than passive usage (e.g., viewing and lurking on others' profiles) (see also Kross et al., 2013; Verduyn et al., 2017), which we assume may further produce different effects on SCC. Future research should thus investigate the moderating role of different types of SNS and SNS functions to better understand the mechanisms of SNS use on SCC.

A related and interesting question is if different sources of social feedback (e.g., parents, peers) received from SNSs may produce distinct effects on identity formation. Previous research suggests that parents and peers may contribute distinctly to young people's identity development in different identity domains. For instance, Meeus et al. (2002) found that parental support was positively associated with adolescents' school identity, while peer support was more closely associated with relational identity. Given that the present research focused on a *general* self-concept, future studies are needed to specify different domains of the self (e.g., relational, academic), and examine whether online social feedback produces domain *general* or *specific* effects on SCC/identity formation.

Additionally, future researchers might investigate SNS effects on SCC for older individuals. Reports released by the Pew Research Center suggest generational differences in how social media is utilized, but also points to a considerable proportion of adults over the age of 65 using SNSs (Anderson & Perrin, 2017; Pew Research Center, 2019). It would be valuable to study whether older individuals, who may have less exposure to SNSs or have established self-concepts not informed by social networking, are vulnerable to self-concept fragmentation in the online space. This is especially pertinent when considering social media technology as a tool for health interventions for older individuals.

Limitations

The present research is not without limitations. First, our cross-sectional design cannot determine causal relations between SNS use and SCC. As we noted earlier, other researchers have investigated the relationship between SNS use and SCC from two, opposed theoretical perspectives – one treating SCC as the outcome variable as we did (see also Appel et al., 2018; Davis, 2013; Lin et al., 2021; Q Liu et al., 2017), and the other treating SCC as the predictor (e.g., Fullwood et al., 2016; Israelashvili et al., 2012; Lee, 2014). It seems possible that the relation between SNS use and SCC is bidirectional. One short-term longitudinal study (Appel et al., 2018) examined the likely causality of their relation, and the cross-lagged panel analysis revealed that Facebook intensity predicted a significant decline in SCC over time whereas the reverse path was not supported. Despite this, additional, future longitudinal studies or randomized experiments are needed to determine the direction of causality of the proposed pathways.

Another relevant concern is that our effect sizes are relatively small both for the direct and indirect paths. We do emphasize that our effect sizes are not discrepant with previous research using similar measurements. For example, Appel et al. (2018) investigated the effect of Facebook intensity on SCC with both cross-sectional and longitudinal methods, and this research revealed comparable, small effect sizes (βs were around 0.10 ~ 0.20). Likewise, G Wang et al. (2019) found the correlation between WeChat use intensity and online/offline social support was significant but also small (*r*s were around 0.20). We argue that, after all, SNSs are only one of the social contexts that can influence the self-development process; and more importantly, as previous mixed evidence has suggested, other than social support and self-esteem, other intervening variables (mediators and/or moderators) and mechanisms (e.g., self-reflection; Yang & Brown, 2016) may also influence the effect of SNS use on SCC. We look forward to future research that investigates how different types/functions of SNSs and their usage may influence SCC, with the hope of further mapping out the different factors and mechanisms that help account for the complex relationship between SNSs and SCC.

Third, the present research assumed that the negative effect of SNS use on SCC was partly due to individuals presenting multiple selves online (thus crafting different identities). However, we did not measure this behavior directly, leaving open whether other explanations can account for the pattern of results. Therefore, it is important that this indicator be better assessed in future designs to confirm the proposed assumption and to build a comprehensive logical chain of the effect of SNS use on SCC.

Finally, the present investigation used a relatively homogenous college student sample, which may not generalize to non-collegiate samples of emerging adults who may

have different reasons for using SNSs (Coyne et al., 2013). Future research would help determine whether the present conclusions hold for different populations.

Despite these limitations, the present research provides a new lens to understand the relationship between SNS use and self-concept clarity, which should help us more effectively intervene on SNS usage to make it beneficial for the development of a clear sense of identity in its users, and in doing so, positively impact other aspects of their well-being.

Notes

1. In the present study we examine self-concept clarity among WeChat users in China. Research in cultural psychology indicates that self construals can differ on some dimensions between Westerners and Easterners (e.g., Markus & Kitayama, 1991; Peng & Nisbett, 1999). In terms of SCC, some research indicates that Canadians, for example, generally scored higher on SCC than participants in an Eastern sample (i.e., Japanese; Campbell et al., 1996). What we emphasize in this research is that empirical evidence has also validated a similar unidimensional factor structure of SCC using different cultural samples (Canadians & Japanese in Campbell et al., 1996; and Chinese in Wu & Watkins, 2009). Further, the clearer sense of self or the maturation of identity was related to better mental health and psychological adjustments in Eastern samples (Chinese) as well (Fang et al., 2012; S Wang et al., 2010).
2. Although there is debate on whether self-enhancement (i.e., the need to maintain positive self-views) is a pan-cultural phenomenon (for details see Heine, 2005; Sedikides et al., 2005), accumulated evidence has revealed that self-enhancement is a fundamental motive also for Easterners, but its manifestations can be tactical with a sensitivity to social context (e.g., social desirability) (Sedikides et al., 2015). For instance, on implicit association tests, Chinese and Japanese, like Westerners, have been found to automatically associate more positive traits with themselves than with others, suggesting a universal need for self-esteem (Cai et al., 2011; Yamaguchi et al., 2007; also see Yang et al., 2017).
3. Removing the 35 younger participants did not significantly influence our main results. Therefore, we kept them in the following analyses.

Acknowledgments

We thank Dr. Zhonglin Wen for the helpful comments on the earlier draft of this work, and thank Dr. Jianling Ma for his helpful suggestions on data analyses. We also would like to thank the editor and three anonymous experts for their very constructive comments and feedback on this work.

Disclosure of potential conflicts of interest

No potential conflict of interest was reported by the author(s).

Funding

This work was supported by the Social Science Planning Project of Shandong Province (21DJYJ06), the Youth Project of the 13th Five-Year Plan of Education Science in Shandong Province (2020QZD003), and the Natural Science Foundation of Shandong Province (ZR2019MC048).

References

Anderson, M., & Perrin, A. (2017). *Tech adoption climbs among older adults*. Pew Research Center.

Appel, M., Schreiner, C., Weber, S., Mara, M., & Gnambs, T. (2018). Intensity of facebook use is associated with lower self-concept clarity: Cross-sectional and longitudinal evidence. *Journal of Media Psychology: Theories, Methods, and Applications*, *30*(3), 160–172. https://doi.org/10.1027/1864-1105/a000192

Archer, S. L. (1989). Gender differences in identity development: Issues of process, domain and timing. *Journal of Adolescence*, *12*(2), 117–138. https://doi.org/10.1016/0140-1971(89)90003-1

Arnett, J. J. (2015). *Emerging adulthood: The winding road from the late teens through the twenties* (2nd ed. ed.). Oxford University Press.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173–1182. https://doi.org/10.1037/0022-3514.51.6.1173

Barrera, J. M. (1986). Distinctions between social support concepts, measures, and models. *American Journal of Community Psychology*, *14*(4), 413–445. https://doi.org/10.1007/BF00922627

Berríos-Allison, A. C. (2005). Family influences on college students' occupational identity. *Journal of Career Assessment*, *13*(2), 233–247. https://doi.org/10.1177/1069072704270320

Besta, T., Mattingly, B., & Błażek, M. (2016). When membership gives strength to act: Inclusion of the group into the self and feeling of personal agency. *The Journal of Social Psychology*, *156*(1), 56–73. https://doi.org/10.1080/00224545.2015.1053838

Błażek, M., & Besta, T. (2012). Self-concept clarity and religious orientations: Prediction of purpose in life and self-esteem. *Journal of Religion and Health*, *51*(3), 947–960. https://doi.org/10.1007/s10943-010-9407-y

Bollich, K. L., Johannet, P. M., & Vazire, S. (2011). In search of our true selves: Feedback as a path to self-knowledge. *Frontiers in Psychology*, *2*, 312. https://doi.org/10.3389/fpsyg.2011.00312

Boyd, D. M., & Ellison, N. B. (2007). Social network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication*, *13*(1), 210–230. https://doi.org/10.1111/j.1083-6101.2007.00393.x

Butzer, B., & Kuiper, N. A. (2006). Relationships between the frequency of social comparisons and self-concept clarity, intolerance of uncertainty, anxiety, and depression. *Personality and Individual Differences*, *41*(1), 167–176. https://doi.org/10.1016/j.paid.2005.12.017

Cai, H., Sedikides, C., Gaertner, L., Wang, C., Carvallo, M., Xu, Y., O'Mara, E. M., & Jackson, L. E. (2011). Tactical self-enhancement in China: Is modesty at the service of self-enhancement in East Asian culture? *Social Psychological and Personality Science*, *2*(1), 59–64. https://doi.org/10.1177/1948550610376599

Campbell, J. D. (1990). Self-esteem and clarity of the self-concept. *Journal of Personality and Social Psychology*, *59*(3), 538–549. https://doi.org/10.1037/0022-3514.59.3.538

Campbell, J. D., Trapnell, P. D., Heine, S. J., Katz, I. M., Lavallee, L. F., & Lehman, D. R. (1996). Self-concept clarity: Measurement, personality correlates, and cultural boundaries. *Journal of Personality and Social Psychology*, *70*(1), 141–156. https://doi.org/10.1037/0022-3514.70.1.141

Caplan, S. E. (2002). Problematic Internet use and psychosocial well-being: Development of a theory-based cognitive–behavioral measurement instrument. *Computers in Human Behavior*, *18*(5), 553–575. https://doi.org/10.1016/S0747-5632(02)00004-3

Che, X., Zhang, Q., Zhao, J., Wei, D., Li, B., Guo, Y., Qiu, J., & Liu, Y. (2014). Synchronous activation within the default mode network correlates with perceived social support. *Neuropsychologia*, *63*, 26–33. https://doi.org/10.1016/j.neuropsychologia.2014.07.035

Chu, P. S., Saucier, D. A., & Hafner, E. (2010). Meta-analysis of the relationships between social support and well-being in children and adolescents. *Journal of Social and Clinical Psychology*, *29*(6), 624–645. https://doi.org/10.1521/jscp.2010.29.6.624

Cicero, D. C. (2017). Self-concept clarity and psychopathology. In J. Lodi-Smith & K. J. DeMarree (Eds.), *Self-concept clarity* (pp. 219–242). Springer.

Cohen, S., & Hoberman, H. M. (1983). Positive events and social supports as buffers of life change stress. *Journal of Applied Social Psychology*, *13*(2), 99–125. https://doi.org/10.1111/j.1559-1816.1983.tb02325.x

Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin*, *98*(2), 310–357. https://doi.org/10.1037/0033-2909.98.2.310

Cooley, C. H. (1902). *The looking-glass self. Human nature and the social order* (pp. 179–185). Scribner's.

Coyne, S. M., Padilla-Walker, L. M., & Howard, E. (2013). Emerging in a digital world: A decade review of media use, effects, and gratifications in emerging adulthood. *Emerging Adulthood*, *1*(2), 125–137. https://doi.org/10.1177/2167696813479782

Davis, K. (2013). Young people's digital lives: The impact of interpersonal relationships and digital media use on adolescents' sense of identity. *Computers in Human Behavior*, *29*(6), 2281–2293. https://doi.org/10.1016/j.chb.2013.05.022

Ellison, N. B., Steinfield, C., & Lampe, C. (2007). The benefits of Facebook "friends:" Social capital and college students' use of online social network sites. *Journal of Computer-Mediated Communication*, *12*(4), 1143–1168. https://doi.org/10.1111/j.1083-6101.2007.00367.x

Emery, L. F., Gardner, W. L., Finkel, E. J., & Carswell, K. L. (2018). "You've changed": Low self-concept clarity predicts lack of support for partner change. *Personality and Social Psychology Bulletin*, *44*(3), 318–331. https://doi.org/10.1177/0146167217739263

Erikson, E. H. (1968). *Identity: Youth and crisis*. Norton.

Fang, X. Y., Yuan, X. J., Cao, H. J., & Xie, Q. H. (2012). Psychological health diathesis assessment system: The development of general self-concept scale for Chinese adults. *Studies of Psychology and Behavior*, *10*(4), 248–254. http://psybeh.tjnu.edu.cn/CN/Y2012/V10/I4/248

Fullwood, C., James, B. M., & Chen-Wilson, C. H. (2016). Self-concept clarity and online self-presentation in adolescents. *Cyberpsychology, Behavior, and Social Networking*, *19*(12), 716–720. https://doi.org/10.1089/cyber.2015.0623

Gentile, B., Twenge, J. M., Freeman, E. C., & Campbell, W. K. (2012). The effect of social networking websites on positive self-views: An experimental investigation. *Computers in Human Behavior*, *28*(5), 1929–1933. https://doi.org/10.1016/j.chb.2012.05.012

Gonzales, A. L., & Hancock, J. T. (2011). Mirror, mirror on my Facebook wall: Effects of exposure to facebook on self-esteem. *Cyberpsychology, Behavior, and Social Networking*, *14*(1–2), 79–83. https://doi.org/10.1089/cyber.2009.0411

Grieve, R., Indian, M., Witteveen, K., Anne Tolan, G., & Marrington, J. (2013). Face-to-face or facebook: Can social connectedness be derived online? *Computers in Human Behavior*, *29*(3), 604–609. https://doi.org/10.1016/j.chb.2012.11.017

Haslam, C., Jetten, J., Cruwys, T., Dingle, G. A., & Haslam, S. A. . (2018). *The new psychology of health: Unlocking the social cure*. Routledge.

Heine, S. J. (2005). Where is the evidence for pancultural self-enhancement? A reply to sedikides, gaertner, and toguchi (2003). *Journal of Personality and Social Psychology*, *89*(4), 531–538. https://doi.org/10.1037/0022-3514.89.4.531

Israelashvili, M., Kim, T., & Bukobza, G. (2012). Adolescents' over-use of the cyber world–Internet addiction or identity exploration? *Journal of Adolescence*, *35*(2), 417–424. https://doi.org/10.1016/j.adolescence.2011.07.015

Jiang, Q. J. (2000). Perceived Social Support Scale (PSSS). *Chinese Journal of Mental Health, Supplement Issue*, 131–133.

Kerpelman, J. L., Pittman, J. F., & Lamke, L. K. (1997). Toward a microprocess perspective on adolescent identity development: An identity control theory approach. *Journal of Adolescent Research*, *12*(3), 325–346. https://doi.org/10.1177/0743554897123002

Kross, E., Verduyn, P., Demiralp, E., Park, J., Lee, D. S., Lin, N., Shablack, H., Jonides, J., & Ybarra, O. (2013). Facebook use predicts declines in subjective well-being in young adults. *PloS One*, *8*(8), e69841. https://doi.org/10.1371/journal.pone.0069841

Kross, E., Verduyn, P., Sheppes, G., Costello, C. K., Jonides, J., & Ybarra, O. Social media and well-being: pitfalls, progress, and next steps. (2021). *Trends in Cognitive Sciences*, *25*(1), 55–66. advance online. https://doi.org/10.1016/j.tics.2020.10.005

Leary, M. R., Tambor, E. S., Terdal, S. K., & Downs, D. L. (1995). Self-esteem as an interpersonal monitor: The sociometer hypothesis. *Journal of Personality and Social Psychology*, *68*(3), 518–530. https://doi.org/10.1037/0022-3514.68.3.518

Lee, S. Y. (2014). How do people compare themselves with others on social network sites?: The case of facebook. *Computers in Human Behavior*, *32*, 253–260. https://doi.org/10.1016/j.chb.2013.12.009

Lin, N. (2001). *Social capital: A theory of social structure and action*. Cambridge University Press.

Lin, S., Liu, D., Niu, G., & Longobardi, C. (2020). Active social network sites use and loneliness: The mediating role of social support and self-esteem. *Current Psychology*, advance online. https://doi.org/10.1007/s12144-020-00658-8

Liu, D., & Baumeister, R. F. (2016). Social networking online and personality of self-worth: A meta-analysis. *Journal of Research in Personality*, *64*, 79–89. https://doi.org/10.1016/j.jrp.2016.06.024

Liu, D., Wright, K. B., & Hu, B. (2018). A meta-analysis of social network site use and social support. *Computers & Education*, *127*, 201–213. https://doi.org/10.1016/j.compedu.2018.08.024

Liu, Q., Niu, G., Fan, C., & ZHOU, Z. (2017). Passive use of social network site and its relationships with self-esteem and self-concept clarity: A moderated mediation analysis. *Acta Psychologica Sinica*, *49*(1), 60–71. https://doi.org/10.3724/SP.J.1041.2017.00060

Lodi-Smith, J., & Crocetti, E. (2017). Self-concept clarity development across the lifespan. In J. Lodi-Smith & K. J. DeMarree (Eds.), *Self-Concept clarity* (pp. 67–84). Springer.

Lu, W., & Hampton, K. N. (2017). Beyond the power of networks: Differentiating network structure from social media affordances for perceived social support. *New Media & Society*, *19*(6), 861–879. https://doi.org/10.1177/1461444815621514

Ludlow, L., & Klein, K. (2014). Suppressor variables: The difference between 'is' versus 'acting as'. *Journal of Statistics Education*, *22*(2), 1–22. https://doi.org/10.1080/10691898.2014.11889703

MacKinnon, D. P. (2000). Equivalence of the mediation, confounding and suppression effect. *Prevention Science*, *1*(4), 173–181. https://doi.org/10.1023/A:1026595011371

Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, *98*(2), 224–253. https://doi.org/10.1037/0033-295X.98.2.224

Matsuba, M. K. (2006). Searching for self and relationships online. *CyberPsychology & Behavior*, *9*(3), 275–284. https://doi.org/10.1089/cpb.2006.9.275

Meeus, W. I. M., Oosterwegel, A., & Vollebergh, W. (2002). Parental and peer attachment and identity development in adolescence. *Journal of Adolescence*, *25*(1), 93–106. https://doi.org/10.1006/jado.2001.0451

Murray, S. L., Holmes, J. G., MacDonald, G., & Ellsworth, P. C. (1998). Through the looking glass darkly? When self-doubts turn into relationship insecurities. *Journal of Personality and Social Psychology*, *75*(6), 1459–1480. https://doi.org/10.1037/0022-3514.75.6.1459

Nezlek, J. B., & Plesko, R. M. (2001). Day-to-day relationships among self-concept clarity, self-esteem, daily events, and mood. *Personality and Social Psychology Bulletin*, *27*(2), 201–211. https://doi.org/10.1177/0146167201272006

Para, E. A. (2008). The role of social support in identity formation: A literature review. *Graduate Journal of Counselling Psychology*, *1*(1), 97–105. https://epublications.marquette.edu/gjcp/vol1/iss1/9

Peng, K., & Nisbett, R. E. (1999). Culture, dialectics, and reasoning about contradiction. *American Psychologist*, *54*(9), 741–754. https://doi.org/10.1037/0003-066X.54.9.741

Pew Research Center (2019). *Social media fact sheet*. Pew Research Center. https://www.pewresearch.org/internet/fact-sheet/social-media/.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879–903. https://doi.org/10.1037/0021-9010.88.5.879

Quinones, C., & Kakabadse, N. K. (2015). Self-concept clarity, social support, and compulsive Internet use: A study of the US and the UAE. *Computers in Human Behavior*, *44*, 347–356. https://doi.org/10.1016/j.chb.2014.11.019

Ridings, C. M., & Gefen, D. (2004). Virtual community attraction: Why people hang out online. *Journal of Computer-mediated Communication*, *10* (1). JCMC10110. https://doi.org/10.1111/j.1083-6101.2004.tb00229.x

Ritchie, T. D., Sedikides, C., Wildschut, T., Arndt, J., & Gidron, Y. (2011). Self-concept clarity mediates the relation between stress and subjective well-being. *Self and Identity*, *10*(4), 493–508. https://doi.org/10.1080/15298868.2010.493066

Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton University Press.

Rosenberg, M., Schooler, C., Schoenbach, C., & Rosenberg, F. (1995). Global self-esteem and specific self-esteem: Different concepts, different outcomes. *American Sociological Review*, *60*(1), 141–156. https://doi.org/10.2307/2096350

Saiphoo, A. N., Halevi, L. D., & Vahedi, Z. (2020). Social networking site use and self-esteem: A meta-analytic review. *Personality and Individual Differences*, *153*, 109639. https://doi.org/10.1016/j.paid.2019.109639

Schwartz, S. J., Meca, A., & Petrova, M. (2017). Who am I and why does it matter? Linking personal identity and self-concept clarity. In J. Lodi-Smith & K. J. DeMarree (Eds.), *Self-concept clarity* (pp. 145–164). Springer.

Sedikides, C., Gaertner, L., & Cai, H. (2015). On the panculturality of self-enhancement and self-protection motivation: The case for the universality of self-esteem. In A. J. Elliot (Ed.), *Advances in motivation science* (Vol. 2, pp. 185–241). Elsevier.

Sedikides, C., Gaertner, L., & Vevea, J. L. (2005). Pancultural self-enhancement reloaded: A meta-analytic reply to Heine (2005). *Journal of Personality and Social Psychology*, *89*(4), 539–551. https://doi.org/10.1037/0022-3514.89.4.539

Seo, M., Kim, J., & Yang, H. (2016). Frequent interaction and fast feedback predict perceived social support: Using crawled and self-reported data of Facebook users. *Journal of Computer-Mediated Communication*, *21*(4), 282–297. https://doi.org/10.1111/jcc4.12160

Shaw, L. H., & Gant, L. M. (2004). In defense of the internet: The relationship between Internet communication and depression, loneliness, self-esteem, and perceived social support. *Journal of Obstetrics and Gynaecology Canada*, *41*(10), 157–171. https://doi.org/10.1089/109493102753770552

Smith, M., Wethington, E., & Zhan, G. (1996). Self-concept clarity and preferred coping styles. *Journal of Personality*, *64*(2), 407–434. https://doi.org/10.1111/j.1467-6494.1996.tb00516.x

Srivastava, S., Tamir, M., McGonigal, K. M., John, O. P., & Gross, J. J. (2009). The social costs of emotional suppression: A prospective study of the transition to college. *Journal of Personality and Social Psychology*, *96*(4), 883–897. https://doi.org/10.1037/a0014755

Steiger, J. H. (1990). Structural model evaluation and modification: An interval estimation approach. *Multivariate Behavioral Research*, *25*(2), 173–180. https://doi.org/10.1207/s15327906mbr2502_4

Tajmirriyahi, M., & Ickes, W. (2020). Self-concept clarity as a predictor of self-disclosure in romantic relationships. *Journal of Social and Personal Relationships*, 37(6), 1873–1891. https://doi.org/10.1177/0265407520911131

Tang, G., & Lee, F. L. (2013). Facebook use and political participation: The impact of exposure to shared political information, connections with public political actors, and network structural heterogeneity. *Social Science Computer Review*, *31*(6), 763–773. https://doi.org/10.1177/0894439313490625

Tibber, M. S., Zhao, J., & Butler, S. (2020). The association between self-esteem and dimensions and classes of cross-platform social media use in a sample of emerging adults–Evidence from regression and latent class analyses. *Computers in Human Behavior*, *109*, 106371. https://doi.org/10.1016/j.chb.2020.106371. advance online.

Tifferet, S. (2020). Gender differences in social support on social network sites: A meta-analysis. *Cyberpsychology, Behavior, and Social Networking*, *23*(4), 199–209. https://doi.org/10.1089/cyber.2019.0516

Turkle, S. (1995). *Life on the screen: Identity in the age of the internet*. Simon and Schuster.

Utz, S., & Breuer, J. (2017). The relationship between use of social network sites, online social support, and well-BeingResults from a six wave longitudinal study. *Journal of Media Psychology: Theories, Methods, and Applications*, *29*(3), 115–125. https://doi.org/10.1027/1864-1105/a000222

Valkenburg, P. M., & Peter, J. (2008). Adolescents' identity experiments on the Internet: Consequences for social competence and self-concept unity. *Communication Research*, *35*(2), 208–231. https://doi.org/10.1177/0093650207313164

Valkenburg, P. M., & Peter, J. (2011). Online communication among adolescents: An integrated model of its attraction, opportunities, and risks. *Journal of Adolescent Health*, *48*(2), 121–127. https://doi.org/10.1016/j.jadohealth.2010.08.020

Valkenburg, P. M., Peter, J., & Schouten, A. P. (2006). Friend networking sites and their relationship to adolescents' well-being and social self-esteem. *Cyberpsychology & Behavior*, *9*(5), 584–590. https://doi.org/10.1089/cpb.2006.9.584

Valkenburg, P. M., Schouten, A. P., & Peter, J. (2005). Adolescents' identity experiments on the internet. *New Media & Society*, *7*(3), 383–402. https://doi.org/10.1177/1461444805052282

Van Dijk, M. P., Branje, S., Keijsers, L., Hawk, S. T., Hale, W. W., & Meeus, W. (2014). Self-concept clarity across adolescence: Longitudinal associations with open communication with parents and internalizing symptoms. *Journal of Youth and Adolescence*, *43*(11), 1861–1876. https://doi.org/10.1007/s10964-013-0055-x

Verduyn, P., Ybarra, O., Résibois, M., Jonides, J., & Kross, E. (2017). Do social network sites enhance or undermine subjective Well-Being? A critical review. *Social Issues and Policy Review*, *11*(1), 274–302. https://doi.org/10.1111/sipr.12033

Vogel, E. A., Rose, J. P., Roberts, L. R., & Eckles, K. (2014). Social comparison, social media, and self-esteem. *Psychology of Popular Media Culture*, *3*(4), 206–222. https://doi.org/10.1037/ppm0000047

Wang, G., Zhang, W., & Zeng, R. (2019). WeChat use intensity and social support: The moderating effect of motivators for wechat use. *Computers in Human Behavior*, *91*, 244–251. https://doi.org/10.1016/j.chb.2018.10.010

Wang, J. L., Jackson, L. A., Zhang, D. J., & Su, Z.-Q. (2012). The relationships among the big five personality factors, self-esteem, narcissism, and sensation-seeking to chinese university students' uses of social networking sites (SNSs). *Computers in Human Behavior*, *28*(6), 2313–2319. https://doi.org/10.1016/j.chb.2012.07.001

Wang, S., Shi, M., & Chen, H. (2010). Ego identity development and its relation to emotional adjustment in college students. *Chinese Journal of Clinical Psychology*, *18*(2), 215–218. https://doi.org/10.16128/j.cnki.1005-3611.2010.02.039

Wang, X. D., Wang, X. L., & Ma, H. (eds.). (1999). *Rating scales for mental health: The self-esteem scale*. In Chinese. China Mental Health Press.

Weiser, E. B. (2001). The functions of Internet use and their social and psychological consequences. *CyberPsychology & Behavior*, *4*(6), 723–743. https://doi.org/10.1089/109493101753376678

Wen, Z., Hau, K. T., & Herbert, W. M. (2004). Structural equation model testing: Cutoff criteria for goodness of fit indices and chi-square test. *Acta Psychologica Sinica*, *36*(2), 186–194. http://journal.psych.ac.cn/acps/EN/Y2004/V36/I02/186

Wen, Z., & Ye, B. (2014). Analyses of mediating effects: The development of methods and models. *Advances in Psychological Science*, *22*(5), 731–745. https://doi.org/10.3724/SP.J.1042.2014.00731

Wu, C. H. (2009). The relationship between attachment style and self-concept clarity: The mediation effect of self-esteem. *Personality and Individual Differences*, *47*(1), 42–46. https://doi.org/10.1016/j.paid.2009.01.043

Wu, J., & Watkins, D. (2009). Development and validation of a Chinese version of the self-concept clarity scale. *Psychologia*, *52*(1), 67–79. https://doi.org/10.2117/psysoc.2009.67

Yamaguchi, S., Greenwald, A. G., Banaji, M. R., Murakami, F., Chen, D., Shiomura, K., Kobayashi, C., Cai, H., & Krendl, A. (2007). Apparent universality of positive implicit self-esteem. *Psychological Science*, *18*(6), 498–500. https://doi.org/10.1111/j.1467-9280.2007.01928.x

Yang, C. C., & Brown, B. B. (2016). Online self-presentation on facebook and self development during the college transition. *Journal of Youth and Adolescence*, *45*(2), 402–416. https://doi.org/10.1007/s10964-015-0385-y

Yang, Q., Ybarra, O., Van den Bos, K., Zhao, Y., Guan, L., Cao, Y., Li, F., & Huang, X. (2019). Neurophysiological and behavioral evidence that self-uncertainty salience increases self-esteem striving. *Biological Psychology*, *143*, 62–73. https://doi.org/10.1016/j.biopsycho.2019.02.011

Yang, Q., Zhao, Y., Guan, L., & Huang, X. (2017). Implicit attitudes toward the self over time in Chinese undergraduates. *Frontiers in Psychology*, *8*, 1914. https://doi.org/10.3389/fpsyg.2017.01914

Zawadzka, A. M., Iwanowska, M., & Borchet, J. (2018). The role of parents, social media and materialism in teenage activism. *Social Psychological Bulletin*, *13*(4), 1–17. https://doi.org/10.32872/spb.v13i4.26706

Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The multidimensional scale of perceived social support. *Journal of Personality Assessment*, *52*(1), 30–41. https://doi.org/10.1207/s15327752jpa5201_2

Lin, S., Liu, D., Liu, W., et al. (2021). Mediating effects of self-concept clarity on the relationship between passive social network sites use and subjective well-being. *Current psychology* (pp. 1–8)