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Impressions Matter More Than Privacy: The Moderating Roles of Affordances in the Relation Between Social Anxiety and Online Safety-Seeking Behaviors

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Abstract

Though socially anxious individuals tend to seek safety, little is known about whether this relationship depends on context, including the affordances of social networking sites (SNSs) to provide anonymity and publicness, and whether safety-seeking can be explained by impression management, privacy calculus or both. Based on the psychobiological model of social anxiety, we conducted two studies (Study 1: N = 103, Study 2: N = 1,184) to examine the contextual dependence of safety-seeking behaviors and to disentangle which types of concerns mediate the effect of social anxiety on safety-seeking behaviors. Results indicated that socially anxious individuals tend to seek safety on SNSs, and this tendency is stronger in less anonymous SNSs. Both evaluative concerns and privacy concerns mediate the relation between social anxiety and safety-seeking behaviors, while the indirect effect of evaluative concerns is stronger than that of privacy. Publicness of an SNS strengthened these indirect effects. These findings highlight the importance of safety perceptions in different online environments, and thereby enrich the literature related to social anxiety and social media use.

Keywords: social anxiety; safety-seeking behaviors; online concerns; anonymity; publicness

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Introduction

Safety is one of the most fundamental psychological needs for human beings (Maslow, 1954), especially for those who feel anxious in social situations (Gilbert, 2001; Karasewich & Kuhlmeier, 2020). Such individuals may adopt various coping strategies, such as over preparation and speaking quietly, to avoid perceived social threats and to protect them from potential rejection (Cuming et al., 2009; Gilbert, 2001; Plasencia et al., 2011). With the proliferation of social networking sites (SNSs), individuals higher in social anxiety may use SNSs to compensate for their unfulfilling offline social interactions (Cheng et al., 2019; Weidman et al., 2012). Indeed, numerous studies have found that SNSs could be more attractive for socially anxious individuals when compared to traditional communication channels like face-to-face (Lee & Stapinski, 2012; Weidman et al., 2012). Several affordances of SNSs, such as controllability and reduced social cues, enable these individuals to conceal their social deficits and

strategically create a desired impression in other users (Burke & Ruppel, 2015; Green et al., 2016; Shaughnessy et al., 2017).

Despite the relatively high amount of time socially anxious users spend on SNSs, evidence suggests that their realized, additional, tangible or intangible benefits from online networks are limited (Cheng et al., 2019). This raises the question why there is a discrepancy between their preferences for SNSs and the actual benefits they receive from them. According to the cognitive-behavioral model (Clark & Wells, 1995) and psychobiological approach of social anxiety (Gilbert, 2001), individuals scoring high on social anxiety tend to amplify potential threats in social situations, which would drive them to take more protective or compensational actions, i.e., safety-seeking behaviors. Hence, a possible explanation for the paradox might be that users with social anxiety are inclined to engage in self-protective behaviors (e.g., Carruthers et al., 2019; Kamalou et al., 2019), rather than socially interactive behaviors. Safety-seeking behaviors refer to covert or overt actions employed to reduce the perceived risk of feared outcomes and increase the sense of safety (Clark & Wells, 1995; Cuming et al., 2009; Plasencia et al., 2011), which could occur in both offline (see review in Piccirillo et al., 2016) and online contexts (Carruthers et al., 2019; Kamalou et al., 2019). Typical online safety-seeking behaviors include choosing a safe communication channel, repeatedly editing the content, removing status updates, or passively browsing profiles without leaving digital traces (e.g., H.-T. Chen, 2018; Ditchfield, 2020; Green et al., 2016; Kamalou et al., 2019). For users with social anxiety, online safety-seeking behaviors may act as necessary coping responses to online threat stimulus and perceived threatening outcomes. Higher threat perception may induce more self-protective behaviors, which would, in turn, make socially anxious users even more anxious (Clark & Wells, 1995).

However, to the best of our knowledge, little is known about how socially anxious individuals perceive and respond to different SNS contexts, such as SNSs with different levels of anonymity and publicness. Numerous studies have investigated how safe (or unsafe) people perceive SNSs to be (e.g., Bodford et al., 2021; Pitcho-Prelorentzos et al., 2020), and revealed that both impression management concerns and privacy concerns are the most concerning issues to social media users (e.g., Alkis et al., 2017; Marder et al., 2016b). However, how concerns about judgement and privacy independently or jointly relate to safety-seeking behaviors, and particularly so for socially anxious SNSs users, remains unclear. Therefore, in order to obtain a better understanding of the discrepancy between SNSs use and social benefits, we investigated the relationship between social anxiety and safety-seeking behaviors in an SNS context, with a particular focus on cognitive mechanisms and contextual effects. This work can help us better understand how socially anxious individuals use SNSs. Importantly, it could shed light on the reasons why users with social anxiety frequently adopt safety-seeking behaviors on SNSs.

Social Anxiety and Safety-Seeking Behaviors on SNSs

Social anxiety refers to feelings of unease, tension and fear in real or expected social situations (Heimberg et al., 1992; Skocic et al., 2015). Evidence from offline observations has shown that people scoring higher on social anxiety are more likely to avoid social situations or engage in safety-seeking behaviors than non-anxious individuals as they tend to allocate more attentional resources to perceived threats (Alden & Bieling, 1998; Clark & Wells, 1995; Cuming et al., 2009; Taylor & Alden, 2010). Evolutionary psychologists theorize that human protective behaviors are guided by two systems, the defense system and the safety system, which would motivate a person to respond to social threats or engage in social interactions, respectively (Gilbert, 2001; Trower & Gilbert, 1989). Individuals with social anxiety tend to use more protective behaviors because they are often in a hierarchical mindset in which they feel judged on their social performance by dominant members, and are thus at risk for being socially hurt (Gilbert, 2001). Within this context, these individuals are continually primed to detect threat and respond with safety-seeking behaviors, such as eye-gaze avoidance and not speaking much, in order to intentionally prevent possible aggression or rejection from the others and thereby allow them to remain part of the social group (Clark & Wells, 1995; Walters & Hope, 1998; Weeks, 2014).

However, according to the psychobiological-ethological model of social anxiety (Gilbert, 2001; Trower & Gilbert, 1989), whether a socially anxious person decides to take protective actions is situationally dependent. Specifically, the defense system may be activated when socially anxious individuals perceive more threats; otherwise, their safety system may be initiated (Trower & Gilbert, 1989). For instance, these individuals may experience reduced arousal and consequently disclose more personal information during online interactions (Schouten et al., 2007), because affordances of the Internet (e.g., nonvisual and text-based, and delayed transmission) may increase their sense of control and reduce the perceived risks of being negatively evaluated by others (Antoniadou et al., 2019; Stuart & Scott, 2021). However, the context of SNSs is more challenging in which users often encounter novel

potential risks (e.g., surveillance, privacy issues, and negative social comparison; see review in Bayer et al., 2020). Due to these online threats, socially anxious individuals may continue to experience high arousal (Rauch et al., 2014) and seek safety when using SNSs (Carruthers et al., 2019; Kamalou et al., 2019; Trower & Gilbert, 1989). Studies have shown that socially anxious individuals tend to be socially less active on SNS (Fernandez et al., 2012; Weidman & Levinson, 2015). Specifically, they prefer to passively use Facebook rather than actively present themselves or interact with existing friends (Shaw et al., 2015; Tian, 2011). Given these, we hypothesize:

H1: Social anxiety will be positively related to safety-seeking behaviors on SNSs.

Threat-Related Concerns on SNSs: Evaluation and Privacy

Although online safety-seeking behaviors are defined as coping responses to perceived interpersonal risks (Kamalou et al., 2019), no study has explored its underlying mechanisms, particularly which threats of SNSs are driving safety-seeking behaviors among users with social anxiety. Previouss studies have suggested that negative evaluation from an audience is the primary threat during offline social encounters (Schlenker & Leary, 1982). While in SNS contexts, two concerns elicited by online audiences might be salient for SNSs users, including evaluative concerns and privacy concerns (Alkis et al., 2017; Calancie et al., 2017). SNSs are typically characterized by highly public spaces in which a user's information, including self-generated and other-generated content, can be observed by other users. Emerging evidence suggests that the blurriness of online information boundaries may encourage the phenomena of interpersonal surveillance on SNSs; that is, contacts in the friend list may tend to monitor how the profile owners present themselves and how they interact with others (B. Liu & Kang, 2017; Tokunaga, 2011). Researchers have suggested that the occurrence of SNSs surveillance may not only reinforce profile owners' concerns about how they are perceived by an online audience (i.e., evaluative concerns; Alkis et al., 2017; Marder et al., 2016b), but also make them become increasingly concerned about whether their personal information shared on the profile might be abused by unknown others, including governments, enterprises and peers (i.e., privacy concerns; Alkis et al., 2017; Erliksson et al., 2020; Trepte et al., 2017), as online surveillance may endanger the security of personal information and property.

These two aforementioned concerns might be even more salient among users with social anxiety, as they are particularly likely to amplify potential threats in social situations (Clark & Wells, 1995; Trower & Gilbert, 1989), such as underestimating others' evaluations of their social performance (Schlenker & Leary, 1982). According to the cognitive-behavioral model, threat perceptions may further motivate socially anxious individuals to utilize safety-seeking behaviors to restore levels of comfort and security (Clark & Wells, 1995). In other words, users with social anxiety may experience more online concerns, which may in turn lead them to manage their online behaviors (e.g., concealing their real thoughts) to avoid making a bad impression or putting their personal information at risk in cyberspace (Burke & Ruppel, 2015; C. Liu et al., 2013; Marder et al., 2016b). For instance, C. Liu et al. (2013) found that, due to the concerns for privacy, users with social anxiety might reduce self-disclosure to manage their personal boundaries and identities on Facebook. Hence, we hypothesize:

H2: Both social evaluative concerns (**H2a**) and privacy concerns (**H2b**) will positively mediate the relationship between social anxiety and safety-seeking behaviors on SNSs.

Furthermore, we theorize that, compared to concerns about privacy, fear of negative evaluations might be a more central characteristic of social anxiety. Social evaluation is related to one's "face", that is, an individual's social reputation, moral status and respectability (Hwang, 1987). Face is one of the core concepts in social life in collectivistic cultures like China, where people desire to "have" and "save" face rather than "lose" face (Taormina & Gao, 2010). This is largely because losing face may impair their ability to accumulate social resources (Hwang, 1987), especially when SNSs connection overlaps with existing offline relations (Lisha et al., 2017). In this vein, although SNS users may be concerned about personal information, their privacy concerns may give way to actual benefits of disclosure, including face saving (Baruh et al., 2017; Proudfoot et al., 2018). Some evidence can be found for SNSs use, suggesting that privacy concerns might not be related to SNSs use intentions or actual usage (Barth & de Jong, 2017; Baruh et al., 2017; Yu et al., 2020), while social evaluative concerns could strongly predict users' coping responses, including their self-presentation and posting behaviors (Bazarova et al., 2013; Gil-Lopez et al., 2018). Hence, we hypothesize:

H2c: In collectivistic cultures (e.g., China), the mediating effect of evaluative concerns on the relationship between social anxiety and safety-seeking behaviors will be stronger than that of privacy concerns.

The Effects of SNSs Affordances

SNSs affordances are the actual or perceived properties or functions of the technology, primarily those fundamental attributes that decide how a technology is used (McFarland & Ployhart, 2015; Norman, 1999). Anonymity and publicness are two main affordances of SNSs (H.-T. Chen, 2018; Mao & DeAndrea, 2019), which may help to distinguish SNS environments (McFarland & Ployhart, 2015). Evidence suggests that, due to the characteristics of low anonymity and high visibility, most SNSs are accompanied by constant scrutiny that could generate a series of online threats, including negative evaluation and privacy risks (Y. Liu et al., 2017; Marder et al., 2016b). Therefore, it is possible that SNS contexts with different degrees of anonymity and publicness may induce different levels of evaluative and privacy concerns among users and therefore result in different levels of safety-seeking behaviors among them.

Comparing Anonymous and Non-Anonymous SNSs

Anonymity refers to the degree to which a communication channel is perceived to allow someone's identity to remain unspecified or unknown (Mao & DeAndrea, 2019; Shaughnessy et al., 2017). SNSs such as Weibo can be categorized as more anonymous compared to other SNS platforms like Qzone and WeChat (also referred to as WeChat Moment). Although these three platforms provide similar broadcasting features to allow users to share information with others, both Qzone and WeChat place more emphasis on socializing with offline acquaintances at the cost of anonymity (L. Chen et al., 2019; Hou et al., 2018), as these two platforms are organized around one's offline networks consisting of kinship, classmates and coworkers. Specifically, Qzone and WeChat are typically tied to users' smartphone numbers, and encourage users to establish bi-directional and reciprocal social networks that consist of intimate social ties, such as family and friends (Apaolaza et al., 2014; L. Chen et al., 2019; Wang & Gu, 2016; Wen et al., 2016). Users on Qzone and WeChat focus on posting texts, photos and videos or viewing blogs to keep up with offline acquaintances rather than strangers (Hou et al., 2018; Wen et al., 2016). On the contrary, Weibo, also named "Chinese Twitter", is a type of micro-blogging site in which users are more likely to devote attention to strangers, such as celebrities, than friends and acquaintances (Zhang & Pentina, 2012). Moreover, Weibo allows its users to build unidirectional networks, which means that users on Weibo could follow anyone they like without obtaining the permission of the person they followed, as well as access others' information without leaving a visiting trace (L. Chen et al., 2019; Zhou et al., 2019). In other words, compared to Qzone and WeChat, Weibo are more likely to tolerate users to detach themselves from actual social circles.

Given their difference in anonymity, individuals higher in social anxiety may perceive more safety on Weibo than on WeChat or Qzone, as the anonymous SNSs may help them reduce the risk of negative self-portrayal and negative evaluation (Kamalou et al., 2019; Shaughnessy et al., 2017). Previous studies have found individuals who are lonely and lack social support prefer to use Weibo over WeChat (Hou et al., 2018). Considering the importance of anonymity among socially anxious individuals (Shaughnessy et al., 2017), we hypothesize:

H3: The positive relationship between social anxiety and safety-seeking behaviors will be stronger on anonymous SNSs (e.g., Weibo) than on non-anonymous SNSs (e.g., WeChat or Qzone).

The Moderating Role of Publicness

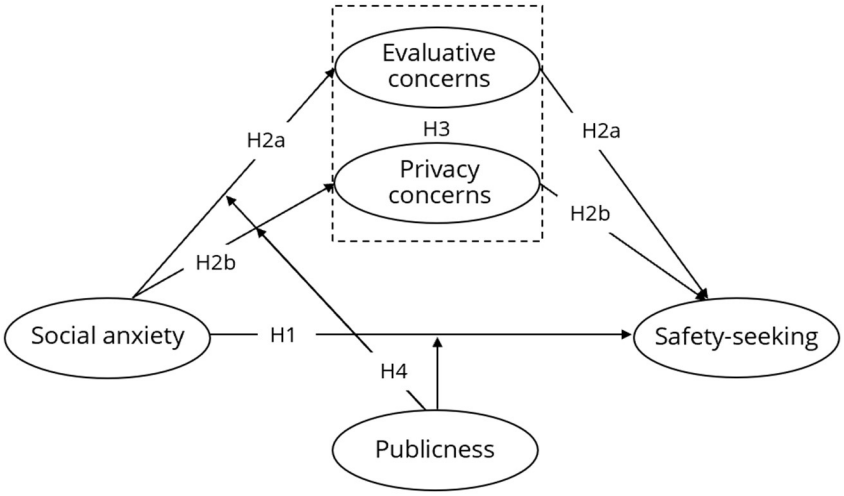
Publicness is another important affordance of SNSs, which reflects the extent of one's social information and behaviors being observed by others (H.-T. Chen, 2018; B. Liu & Kang, 2017). A higher level of publicness provides a higher likelihood of social surveillance, which may result in activation of the defense system and increase vigilance (Trower & Gilbert, 1989). This could be especially the case for less anonymous SNSs, such as WeChat, Qzone, and Facebook, in which users have established an increasingly diverse network comprised of classmates, family members, colleagues, friends and strangers (Manago et al., 2012; Pang, 2022). Hence, higher levels of publicness on these sites would represent the collapse of interaction context across diverse audiences, which may lead socially anxious individuals to experience higher challenges for impression and privacy management (Alkis et al., 2017; Gil-Lopez et al., 2018; Vitak, 2012). In turn, these concerns may result in more safety strategies, such as inhibiting self-expression (Green et al., 2016; Luo et al., 2019; Marder et al., 2016a). Evidence from a two-wave panel suggests that individuals with higher fear of social isolation are more likely to inhibit their expressive behaviors on SNSs; this tendency was stronger when their network had a higher level of publicness (H.-T. Chen, 2018). Therefore, we hypothesize:

H4: Publicness of an SNS will moderate the indirect effects of social anxiety on safety-seeking behaviors through evaluative and privacy concerns. Specifically, the higher level of publicness, the stronger indirect effect of social anxiety on safety-seeking behaviors will be observed.

The Current Study

The main purposes of this study are to examine a) the relationship between social anxiety and safety-seeking behaviors on SNSs, b) how this relationship is moderated by the SNS affordances of anonymity and publicness, and c) whether evaluative concerns and privacy concerns independently or jointly mediate this relationship. Against this backdrop, two studies were conducted. In Study 1, we were interested in whether impression and privacy management are major concerns among SNSs users. Additionally, we compared two different types of SNSs (i.e., anonymous vs. non-anonymous) to examine whether socially anxious individuals seek more safety in non-anonymous SNSs. In Study 2, we attempted to integrate threat-related cognition (i.e., social evaluative and privacy concerns) and coping behaviors (i.e., safety-seeking) in a model to understand what kind of online concerns drive their safety-seeking behaviors (see Figure 1). In order to further understand whether these relationships are context-dependent, Study 2 integrated another contextual factor, publicness, which could reflect the extent of information visibility. Overall, this study aims to explore the effects of contextual factors on safety-seeking behaviors among users with social anxiety by comparing different SNS platforms and contexts, and to clarify their underlying cognitive process by comparing the mediating effects of evaluative concerns and privacy concerns.

Figure 1. *Moderated Mediation Model Between Social Anxiety and Safety-Seeking Behaviors.*



Study 1

In Study 1, we used a small sample to examine the relationship between social anxiety and safety-seeking behaviors (H1), and to compare whether this relationship is stronger for non-anonymous SNSs than for anonymous SNSs (H3). An open-ended question was also used to identify whether negative evaluation and privacy concerns are the biggest threats for Chinese SNS users. In this study, the non-anonymous SNSs were WeChat and Qzone while the anonymous SNS was Weibo.

Methods

Procedure and Participants

Using convenience sampling, we recruited participants by posting online advertisements to a pool of students at a public university in China. Participants were invited to take part in a free online survey through Wenjuanxing (https://www.wjx.cn) during the fall semester, 2020. The original sample of 108 agreed to participate in this survey, while five participants reported they did not use anonymous SNSs and were thus excluded from the final analysis. A final sample of 103 (M_{age} = 20.93, *SD* = 2.12, 42.72% male) emerging adults who used both non-anonymous and anonymous SNSs remained. Most participants (*n* = 91, 88.35%) reported the use of both WeChat and Qzone, and few participants did not use WeChat (*n* = 5, 4.85%) or Qzone (*n* = 7, 6.80%). A total of 64 participants used Weibo,

and the others used other interest-based online communities, including Zhihu, Douban and Baidu Tieba, which focus on interacting with online strangers rather than offline friends. All participants provided electronic informed consent after being briefly introduced to the purpose of this study. Each participant completed the online questionnaires survey (demographic characteristics, social anxiety, safety-seeking behaviors on non-anonymous and anonymous SNSs), and answered an open-ended question to describe their fears and concerns on SNSs.

Measures

Social Anxiety. The six-item Social Interaction Anxiety Scale (SIAS-6) and six-item Social Phobia Scale (SPS-6) (Peters et al., 2012) are abbreviated version of the original SIAS-SPS scale (Mattick & Clarke, 1998), were used together to assess the perceived social deficits dimension of social anxiety in two social contexts. The SIAS-6 measures anxiety experienced in social interactions (e.g., *I have difficulty making eye contact with others*), and the SPS-6 assesses anxiety experienced in situations of being scrutinized by others (e.g., *When in an elevator, I am tense if people look at me*). Participants rated their experience on a 5-point scale from 1 = *not at all* to 5 = *extremely*, with higher scores representing higher level of social anxiety. The internal consistency for social anxiety was .92, and α = .87 and .88 for SIAS-6 and SPS-6, respectively.

Safety-Seeking Behaviors on SNSs. A total of 10 items were used to assess safety-seeking behaviors on SNSs. Eight of ten items were adapted from the Seeking Online Safety Questionnaire (SOSQ; Kamalou et al., 2019). Another two items (*carefully select the photos that I want to upload* and *hide my voice*) were added to the initial pool of eight items because both photo-related activities and auditory elements were common on non-anonymous and anonymous SNSs. Using a scale ranging from 1 = *never* to 5 = *always*, participants separately answered the extent to which they seek safety on WeChat/Qzone and Weibo/other anonymous SNSs. For example, *spend much time in editing content I want to post on WeChat/Qzone (or Weibo).* A higher score means more frequently seek safety on this type of SNS platform. In this study, the Cronbach coefficients for safety-seeking behaviors on non-anonymous and anonymous SNSs were .85 and .86, respectively.

Control Variables. Participants provided demographic information, including age and gender. Daily time spent on each type of SNSs was measured by asking *how much time did you spend on WeChat and Qzone each day* and *how much time did you spend on Weibo and other online platforms each day*. Participants responded on a scale of nine options, with 1 = *less than 10 minutes*, 2 = *10 to 30 minutes*, 3 = *30 to 60 minutes*, 4 = *1 to 2 hours*, 5 = *2 to 3 hours*, 6 = *3 to 4 hours*, 7 = *4 to 5 hours*, 8 = *5 to 6 hours*, and 9 = *more than 6 hours*.

Statistical Analysis

We used SPSS 22 for descriptive statistics and Mplus 8.3 for all main analyses in these two studies. Considering the small sample size in Study 1, we calculated the mean score of each variable to represent our main variables. Then, path analyses with social anxiety as the predictor and safety-seeking behaviors on each type of SNSs as dependent variables were conducted to test H1. In order to test H3: whether socially anxious individuals would seek more safety on non-anonymous SNSs (versus anonymous SNSs), a Wald test was used to compare the regression coefficients of social anxiety and safety-seeking behaviors across different SNSs, with significant chi-square (i.e., $p < .05$) indicating a significant difference.

Results

Table 1 presents the descriptive statistics and correlation coefficients between variables. Approximately 77.7% of the participants ($n = 80$) spend more than one hour on non-anonymous SNSs (e.g., WeChat and Qzone) each day, while the majority of participants ($n = 74$, 71.8%) spend less than one hour on anonymous SNSs (e.g., Weibo or other interest-based platforms). As shown in Table 1, participants spend much more time on WeChat/Qzone ($M = 4.87$, $SD = 1.90$) than on Weibo/other anonymous SNSs ($M = 2.73$, $SD = 1.63$), $t(102) = 9.87$, $p < .001$. Meanwhile, they tend to seek safety more frequently on WeChat/Qzone ($M = 2.82$, $SD = 0.78$) than Weibo/other anonymous SNSs ($M = 2.61$, $SD = 0.80$), $t(102) = -2.51$, $p = .013$. Additionally, social anxiety exhibited a significant positive correlation with safety-seeking behaviors on WeChat/Qzone ($r = .44$, $p < .001$), but not on Weibo/other anonymous SNSs ($r = .19$, $p = .056$).

Table 1. *Descriptive Statistics and Intercorrelations Between All Variables in Study 1 (N = 103).*

Variables	*M*	*SD*	1	2	3	4	5	6
1. Gender	0.57	0.50	—					
2. Age	20.93	2.12	—	—				
3. Daily time on W/Q	4.87	1.90	.12	−.22*				
4. Daily time on Weibo	2.73	1.63	.17	.06	.23*			
5. Social anxiety	2.12	0.83	−.05	−.05	−.06	−.06		
6. SSB on W/Q	2.82	0.78	−.08	−.06	.21*	−.05	.44***	
7. SSB on Weibo	2.61	0.80	−.11	−.01	.10	.17	.19	.45***

Note. Gender was dummy coded such that 0 = male and 1 = female. W/Q = WeChat/Qzone; Weibo = Weibo/other non-anonymous SNSs. SSB = Safety-seeking behaviors. $^{*}p < .05$, $^{***}p < .001$.

After controlling gender, age and time spent on each platform, the results of path analysis showed that participants who scored higher in social anxiety would seek more safety on both WeChat/Qzone ($b = .46$, $p < .001$) and Weibo/other anonymous SNSs ($b = .19$, $p = .039$). A Wald test indicated that the impact of social anxiety on safety-seeking behaviors was significantly stronger for WeChat/Qzone than for Weibo/other anonymous SNSs ($\chi^2(1) = 6.04$, $p = .014$).

To identify why SNSs users seek safety, two coders who were blind to the research hypotheses coded the responses on the open-ended question. They sorted participants' concerns into three categories and different categorizations were discussed until agreement was reached. The agreement of the two coders was sufficient (κ = .76 to .82). One category indicated online security and privacy concerns (53.40%, 55/103). For example, *Some strangers often browse my profiles. I'm worried whether they have learned about my names, contacts and even my home address* and *My privacy has been leaked and opened online*. The second category indicated impression management and fears of negative social evaluation (43.69%, 45/103). For instance, *I did not receive any likes or comments, so I decide not to post anymore*, *I'm worried that my friends will find something that may be different from my offline identify*, and *I'm feared that my family members and teachers will criticize me when I posted too much entertainment information such as eating, drinking and playing on WeChat*. Other concerns (e.g., fear of missing out, fear of negative news/messages) were present, but are irrelevant to social surveillance, so they did not get categorized. Therefore, two major concerns were identified: one involved in privacy concerns, and the other involved in social evaluation and impression management.

Study 2

Study 1 revealed that people higher in social anxiety seek safety more frequently on less anonymous SNSs (e.g., Qzone and WeChat), and the open-ended question suggested that users with social anxiety exhibited safety seeking behaviors on SNSs for the sake of decreasing concerns over privacy and negative social evaluation from others. Considering these findings, we designed Study 2 to confirm if the potential mediating roles of privacy and negative evaluation concerns could be empirical supported. Additionally, we sought to understand how the affordance of publicness may moderate the mediation between social anxiety, two types of concerns, and safety seeking behaviors. It should be noted that we tested these hypotheses in Study 2 by focusing on users' behaviors on less anonymous SNSs, considering the findings in Study 1 suggested that safe-seeking behaviors were less likely to occur in anonymous online settings.

Method

Procedure and Participants

Participants were recruited in the winter of 2020, through Psychology and Physical Education courses from four public universities located in different provinces. Students received course credit in exchange for participation. We chose undergraduate students as our research sample because this population accounts for the largest proportion of Chinese Internet users (CNNIC, 2021). Due to the influence of COVID-19, students in one of the four universities completed paper-and-pencil surveys ($N = 394$), while the others completed online questionnaires through Wenjuanxing ($N = 834$). A total of 1,228 undergraduate students took part in the study. After deleting invariant and incomplete responses, we obtained $N = 1,184$ valid surveys corresponding to a response rate of 96.4

percent. Of this sample, *n* = 677 participants were females (57.3%). Most students were Han, with a mean age of 19.21 (*SD* = 1.60). All of them indicated that they are SNSs users, more specifically Qzone or WeChat users, with approximately 67.82% of participants rating Qzone as their most frequently visited SNS platform, followed by WeChat (29.22%; see Table 2).

The survey was conducted by well-trained Psychology graduate students. Participants provided written or electronic consent after being informed of the purpose of this study. After that, participants reported their demographic information, basic information of Qzone/WeChat use (i.e., number of friends and time spent on Qzone/WeChat) and questionnaire surveys (i.e., social anxiety, evaluative and privacy concerns, publicness, and safety-seeking behaviors on Qzone/WeChat). The university's IRB approved this study.

Table 2. *Descriptions of the Sample in Study 2.*

	Frequency	Percentage (%)
Gender		
Female	677	42.57
Male	504	57.18
Most frequently visited platform		
Qzone	803	67.82
WeChat	346	29.22
Others	35	2.96
Time spent on SNS each day		
< 10 min	38	3.21
10–30min	102	8.61
30–60 min	195	16.47
1–2 hours	271	22.89
2–3 hours	205	17.31
3–4 hours	157	13.26
4–5 hours	79	6.67
5–6 hours	45	3.80
> 6 hours	92	7.77
Number of friends on SNS		
< 100	257	21.71
101–200	353	29.81
201–300	268	22.64
301–400	135	11.40
401–500	68	5.74
501–600	39	3.29
> 600	52	4.39

Note. Two participants did not report gender, and other 12 participants missed reporting the number of friends they had on the SNS.

Measures

Social Anxiety. As in Study 1, SIAS-6 and SPS-6 (Peters et al., 2012) were used together to assess the perceived social deficits dimension of social anxiety. The internal consistency for social anxiety was .94, and α = .88 and .91 for SIAS-6 and SPS-6, respectively.

Safety-Seeking Behaviors. Ten items of SOSQ (Kamalou et al., 2019) were used to assess safety-seeking behaviors in the contexts of Qzone and WeChat. As in Study 1, participants were instructed to rate how often they used these ten strategies on Qzone/WeChat platform (e.g., *control how much information others learn about me*). Answering options ranged from 1 = *never* to 5 = *always*. One item (*protect my personal privacy on Qzone/WeChat*) was deleted in the final analysis due to low factor loading (< .30), leaving nine items in the final analysis. In this study, the internal consistency of safety-seeking behaviors was acceptable (α = .72).

Publicness. A six-item publicness scale[1] adapted from Chen (2018) was used to assess the extent to which participants make their Qzone/WeChat profile public, e.g., *my network can find out what kind of person I am*. Each item was rated on a 7-point scale, ranging from 1 = *strongly disagree* to 7 = *strongly agree*. A higher score means higher level of publicness. The reversed item (*I have changed the privacy setting to limit my profile visibility*) was deleted because of factor loading lower than .30, leaving five items in the final analysis. In the present study, the Publicness Scale indicates good internal consistency (α = .85).

Evaluative Concerns. Evaluative concerns in an SNS context was assessed using 10 items adapted from the Evaluation Anxiety Subscale of the Social Anxiety Scale for social media users (SAS-SMU; Alkis et al., 2017). Participants were asked to rate their levels of concerns about negative social evaluations from their SNS friends (e.g., *On Qzone/WeChat, I am concerned about disapproval of my behaviors by others*) using a 5-point Likert scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*. Higher scores reflect more concerns about social evaluation. Internal consistency for evaluative concerns was very good (α = .93).

Privacy Concerns. To measure the degree of privacy concerns, we used 5 items derived from the Privacy Concern Anxiety Subscale of SAS-SMU (Alkis et al., 2017). Participants reported their concerns about the access of their personal information by other SNS users using a 5-point scale (1 = *strongly disagree;* 5 = *strongly agree*), with higher scores representing higher levels of privacy concerns. Here is one sample item: *I would be concerned if my Qzone/WeChat is accessed without my consent*. The internal consistency for privacy concerns was α = .86.

Control Variables. As in Study 1, we controlled age, gender and daily time spent on SNS. Number of friends was also included as a control variable. To assess the number of friends and daily time spent on SNSs, we asked participants for their primarily used SNS (i.e., WeChat, Qzone or others), the number of friends they have on this platform, and how much time they spend on this platform each day. If a participant reported another SNS as their more frequently visited SNS, they were asked to report the total number of friends and total time spent on both Qzone and WeChat.

Statistical Analysis

First, variables were checked for normality using the Kolmogorov-Smirnov test. Although no variable was normally distributed, the skewness values for all variables ranged from −.60 to .51, and kurtosis values ranged from −.62 to .18, which were within acceptable ranges (Muthen & Kaplan, 1985). Additionally, variables in this study did not exhibit severe multicollinearity problems as indicated by all tolerance values being larger than .10 and variance inflation factor (VIF) of all variables being below 2 (Mertler & Reinhart, 2016).

Structural equation models (SEM) were estimated with maximum likelihood. Full information maximum likelihood estimation was used to include participants with missing data on gender and the number of friends. Model fit was evaluated with chi-square statistics, the CFI and TLI, RMSEA and the SRMR. The CFI and TLI should be larger than .90 and the values of RMSEA and SRMR lower than .08 represent acceptable fit (Byrne, 2013). To test the mediating effects (H2a and H2b), we first employed a multiple mediation model, i.e., putting evaluative and privacy concerns as mediator variables in the model together, with 1,000 bootstrap samples to produce 95% confidence intervals (CIs). If the 95% CI did not include zero, we concluded that the mediating effect was statistically significant. We then compared the difference in the mediating effects of evaluative and privacy concerns (H2c) using a Wald test, with significant chi-square (i.e., $p < .05$) indicating a significant difference. After that, a moderated mediation model with latent variables was conducted to examine the proposed moderating role of publicness on the relationship between social anxiety and safety behaviors as well as the mediating effects of evaluative and privacy concerns (H4). An interaction term was defined as the product of the latent independent and moderator variables (Cheung & Lau, 2017).

Results

Descriptive Analysis

Table 3 presents means, standard deviations (*SD*), and inter-correlations for all variables. All key predictors showed a small to medium correlation with safety-seeking behaviors ($r = .06$ to .38), and evaluative concerns exhibited the highest correlation with safety-seeking behaviors ($r = .38$, $p < .001$).

Table 3. *Descriptive Statistics and Intercorrelations Between All Variables in Study 2.*

Variables	*M*	*SD*	1	2	3	4	5	6	7	8
1. Gender	0.57	0.50	—							
2. Age	19.21	1.60	—	—						
3. Number of friends	2.77	1.58	.13***	.15***	—					
4. Daily time on SNS	4.75	2.03	.20***	.04	.13***	—				
5. SA	2.06	0.79	.03	.01	−.12***	.01	—			
6. Publicness	4.75	1.22	.02	.01	.06	.01	−.11**	—		
7. EVA-CON	2.43	0.90	.00	.05	.02	.03	.55***	−.02	—	
8. PRI-CON	2.80	1.01	.01	.02	−.01	.07**	.35***	−.08**	.47***	—
9. SSB	2.92	0.66	.07*	.08*	.06*	.06	.30***	.08*	.38***	.29***

Note. Gender was dummy coded such that 0 = male and 1 = female. SA = Social anxiety. EVA-CON = Evaluative concerns. PRI-CON = Privacy concerns. SSB = Safety-seeking behaviors. $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

Testing the Mediation and Moderation Effects

Multiple mediation analysis with SEM was used to test the mediating effects of two types of concerns (social evaluation and online privacy) in the relationship between social anxiety and safety-seeking behaviors. Four control variables (age, gender, number of SNS friends, and daily time spend on SNS) were all regressed on the mediating and dependent variables. This mediation model fits our data well, $c^2/df = 3.74$, CFI = .916, TLI = .908, RMSEA = .048, 95% CI [.046, .050], SRMR = .051. Results showed that social anxiety was positively related to safety-seeking behaviors on SNS ($b = .32$, $p < .001$), supporting H1. Both social evaluative concerns and privacy concerns could mediate the relationship between social anxiety and safety-seeking behaviors. Specifically, the mediating effect of social evaluative concerns was .18, $SE = .047$, $p < .001$, 95% CI [.090, .274], and for privacy concerns was .06, $SE = .020$, $p = .003$, 95% CI [.020, .098], thus, supporting H2a and H2b. H2c proposed that the mediating role of evaluative concerns was stronger than that of privacy concerns. A Wald test for the mediating effects demonstrated a significant difference, with the mediating effect of evaluative concerns being comparatively stronger than the indirect effect of privacy concerns, $\chi^2(1) = 6.54$, $p = .011$. Thus, H2c was supported.

Table 4. *Tested Mediation and Moderation Effects in Study 2.*

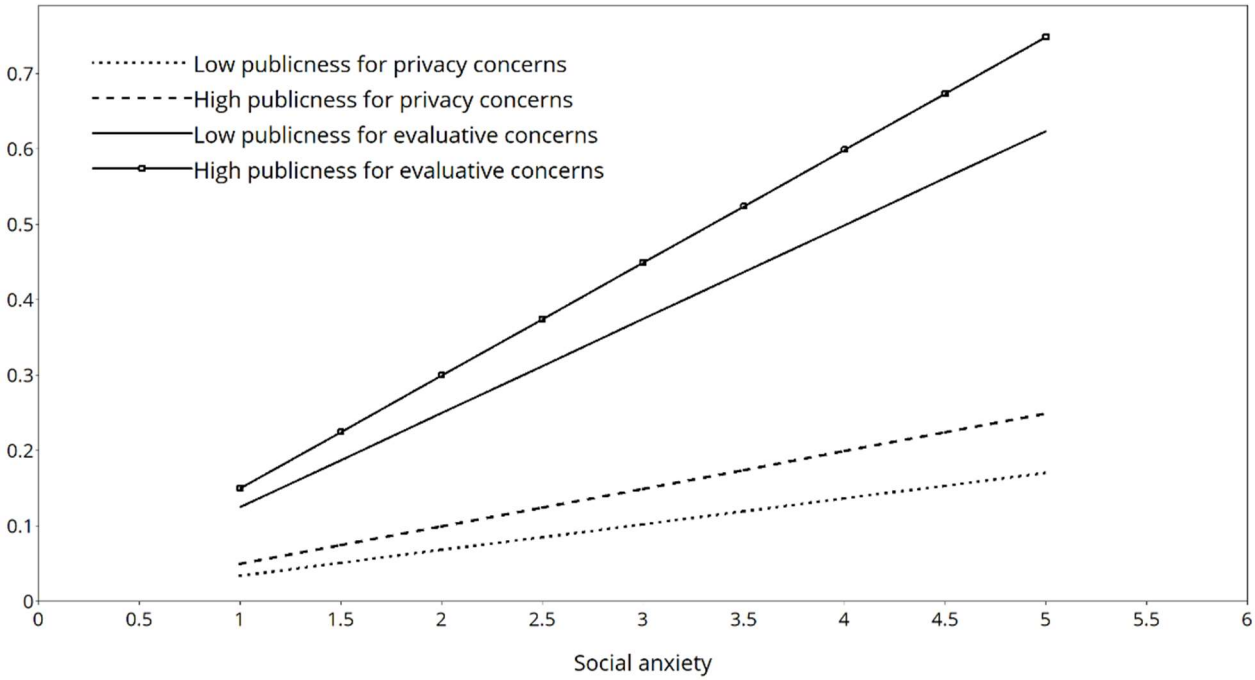
Variables	Evaluative concerns				Privacy concerns				Safety-seeking			
			95% CI				95% CI				95% CI	
	β	*p*	LL	UL	β	*p*	LL	UL	β	*p*	LL	UL
Gender	−.01	.548	−.065	.039	.15	< .001	.093	.213	.14	.001	.037	.237
Age	.03	.263	−.029	.084	−.02	.621	−.079	.048	.09	.022	.005	.166
Number of friends	.10	< .001	.043	.147	.02	.405	−.038	.085	.04	.300	−.044	.118
Daily time on SNS	.02	.475	−.034	.074	.04	.183	−.021	.105	−.05	.315	−.141	.049
SA	.62	< .001	.546	.666	.39	< .001	.306	.450	.32	< .001	.173	.460
Publicness	.03	.310	−.023	.073	.02	.597	−.040	.070	.16	< .001	.084	.240
SA×Publicness	.06	.020	.009	.106	.08	.009	.019	.131	.06	.154	−.021	.133
EVA-CON									.29	< .001	.147	.438
PRI-CON									.15	.002	.053	.248
R-square	**.39**	**< .001**			**.19**	**< .001**			**.47**	**< .001**		

Note. Standardized coefficients were presented. Male = 0, Female = 1. SA = Social anxiety. EVA-CON = Evaluative concerns. PRI-CON = Privacy concerns. SSB = Safety-seeking behaviors.

Finally, we conducted a moderated mediation model to test whether these relationships depended on publicness. As shown in Table 4, publicness was positively related to safety-seeking behaviors ($b = .16$, $p < .001$). Moreover, the moderating effect of publicness was significant for the relationship between social anxiety and evaluative concerns ($b = .06$, $p = .020$), as well as social anxiety and privacy concerns ($b = .08$, $p = .009$). Specifically, the indirect effects of social anxiety on safety-seeking behaviors through two mediators were stronger in the higher publicness conditions (evaluative concerns: $b_{\text{mediate}} = .15$, $p = .003$, 95% CI [.087, .212]; privacy concerns: $b_{\text{mediate}} = .05$, $p = .005$, 95% CI [.016, .083]) than those in the lower publicness conditions (evaluation concerns: $b_{\text{mediate}} = .13$, $p = .002$, 95%

CI [.072, .178]; privacy concerns: $b_{mediate}$ = .03, p = .004, 95% CI [.010, .058]) (see Figure 2). As such, socially anxious individuals in a highly public SNS context were more likely to have concern about evaluations and privacy and thus seek more safety, than those in a less publicness context of SNS, supporting H4.

Figure 2. *Publicness Moderated the Indirect Effects of Social Anxiety on Safety-Seeking Through Evaluation and Privacy Concerns.*



Note. Conditions for moderator publicness are the mean ± 1 standard deviation from the mean.

Discussion

Given the discrepancy between socially anxious individuals' preferences for SNSs and the limited social benefits from SNSs, this study aimed to test the associations between social anxiety, threat-related concerns, and safety-seeking behaviors and if the anonymity and publicness of SNS would moderate these links. We found that social anxiety was positively related to safety-seeking behaviors on SNSs and this relationship was stronger in non-anonymous SNSs than in anonymous SNSs. Both social evaluative and privacy concerns positively mediated the association between social anxiety and safety-seeking behaviors, while the role of privacy is much weaker than that of social evaluative concerns among Chinese SNSs users. Additionally, a higher level of publicness leads to a stronger relationship between social anxiety and safety-seeking behaviors through these two types of concerns, especially through the role of impression management related concerns. Combining online contextual factors (e.g., the digital affordance of anonymity and publicness) and online concerns (e.g., evaluative and privacy concerns) into the appraisal-coping process among socially anxious individuals, this study has extended the psychobiological model of social anxiety (Trower & Gilbert, 1989). Overall, our results suggest that threat perceptions of SNS environments, particularly evaluative concerns, can lead socially anxious individuals to exhibit more safety-seeking behaviors. High publicness of SNS would further increase safety-seeking behaviors among socially anxious individuals. These findings further enrich our understandings of how socially anxious individuals perceive and respond to different SNS contexts, and also provide empirical evidence for their self-protective tendencies.

Consistent with H1, we found that social anxiety was positively related to safety-seeking behaviors. This finding supports the psychobiological model (Trower & Gilbert, 1989) and the cognitive-behavioral model of social anxiety (Clark & Wells, 1995), suggesting that socially anxious individuals tend to adopt safety-seeking behaviors to prevent feared outcomes in their minds. Although most prior online communication theories, including the social compensation hypothesis, have emphasized the positive side of online attributes, and assumed that SNSs may encourage socially anxious individuals to engage in more online social interactions (Valkenburg & Peter, 2007), we observed in this study that socially anxious individuals tend to seek safety in SNS contexts. This finding is consistent with recent studies which have revealed that SNS context could be an extension of offline real-life that cannot thoroughly change socially anxious individuals' behavioral patterns (Fernandez et al., 2012; Kamalou et al., 2019).

This suggests that neither overcoming problems in threat-safety balance nor enhancing social approach behaviors among socially anxious individuals is a trivial enterprise that can be achieved merely by turning to SNSs.

As expected in H2a and H2b, social anxiety was positively related to both evaluative and privacy concerns, and in turn, triggered online behaviors aimed at seeking safety. These findings are consistent with previous research which has found that impression management and privacy calculus are major concerns among SNSs users (e.g., Alkis et al., 2017; Calancie et al., 2017). These findings could be an important progress in the research field of social anxiety because the cognitive-behavioral model of social anxiety suggested that people with social anxiety tend to adopt safety behaviors when they perceive threats from evaluative situations, such as public speaking (e.g., Clark & Wells, 1995; Menatti et al., 2015). Our results highlight the combined roles of impression management and privacy calculus resulting in online safety-seeking behaviors among socially anxious individuals (Burke & Ruppel, 2015; C. Liu et al., 2013), and indicate that not only the fears of others' views, but also the fears or distrust of unknown others can be triggers for these individuals' self-protection behaviors in the context of SNSs.

Moreover, our findings further demonstrated that SNSs users with social anxiety would be more sensitive to evaluative threat than privacy threat, which may in turn lead to more safety-seeking behaviors. This finding is consistent with the privacy paradox, suggesting that concerns for privacy hardly change one's actual online behaviors (Barth & de Jong, 2017; Taddicken, 2014). The possible explanation might be that impression management is rooted in human evolution, which could be a more central concept than privacy concerns, particularly in populations of collectivistic and socially anxious individuals (Gilbert, 2001; Hwang, 1987). Future research could compare the effects of these two types of concerns in a more anonymous SNS platform or in a more individualistic culture.

In terms of the contextual effects of these relationships, we found that both anonymity and the publicness affordance affected the relationships between social anxiety and safety-seeking behaviors. Specifically, non-anonymous SNSs are more likely to induce safety-seeking behaviors among socially anxious individuals than anonymous SNSs. Similarly, the higher the level of publicness, the stronger were the observed relationships between social anxiety, evaluative and privacy concerns, which, in turn, were associated with stronger online safety-seeking behaviors. These findings are in line with our main hypothesis regarding contextual effects, and are also consistent with prior studies on contextual frameworks of social media (Antoniadou et al., 2019; McFarland & Ployhart, 2015). These findings suggest that the characteristics of SNS contexts (e.g., anonymity, privacy) could have impacts on one's safety perceptions and usage behaviors (H.-T. Chen, 2018; Mao & DeAndrea, 2019; McFarland & Ployhart, 2015). For instance, Mao and DeAndrea (2019) found that users are more likely to evaluate a communication channel with more anonymity or less visibility to be a safer channel than those with less anonymity or more visibility.

Nevertheless, it is important to note that whether in an anonymous or non-anonymous SNS, social anxiety was positively related to safety-seeking behaviors; publicness of SNS also had relatively small effects on the relationships between social anxiety, evaluative and privacy concerns. This may indicate that safety-seeking behaviors could be more likely to differ from person to person rather than situation to situation. This is consistent with extant literature which has shown that safety-seeking behaviors among socially anxious individuals would occur in both offline (e.g., Plasencia et al., 2011) and online contexts (e.g., Carruthers et al., 2019; Kamalou et al., 2019; Shaughnessy et al., 2017). Though features of SNSs, such as anonymity or privacy, could offer interpersonal safety to a certain extent (Mao & DeAndrea, 2019), our findings reveal that socially anxious individuals continuously tend to utilize their defense system to navigate their online behaviors in a wide range of SNS contexts, including both anonymous and non-anonymous as well as private or public SNS contexts. This may further underscore the point, that is, their use of SNSs may be motivated in large part by self-protective rather than social and interpersonal demands.

Implications, Limitations and Future Directions

The novelty of this study is that we combined impression management and privacy calculus to understand why social anxiety related to safety-seeking behaviors on SNSs, and we also examined contextual factors (anonymity and publicness of SNS). Our findings suggest that SNSs, particularly non-anonymous with a higher levels of publicness, may be a threatening place for socially anxious individuals. Concerns about social evaluation and privacy can drive them to adopt higher safety standards for their SNS profiles. This comes with important practical implications. First, given that socially anxious individuals tend to seek safety in various SNS contexts, more attention is needed to understand SNS use among this population, since they may deliberately choose SNS

platforms and features to avoid perceived interpersonal threats. Second, the combined mediating roles of evaluative and privacy concerns highlight the necessity for future practitioners to expand their focus to include privacy concerns, as these two types of concerns would increase online safety-seeking behaviors. Finally, digital companies could increase online safety perceptions and thus promote a healthier use of SNSs by improving users' authorization of controlling personal information and visible audience. For example, limiting the visibility of social feedback to other users so as to help reduce the pressure of both posters and receivers (Kim & Gonzales, 2018).

Of course, the present study was not without limitations. The first limitation is the sample. We included two relatively homogeneous student groups with regards to age and cultural background (i.e., Han), and the sample in Study 1 is rather small. Future researchers may consider testing safety-seeking behaviors in other samples including older and younger age groups as well as groups from different ethnicities and with different cultural backgrounds. Second, our study applied two cross-sectional designs in which causality cannot be inferred. Although personal traits were often considered to be antecedents of an individual's online behavior, cognitive-behavioral models of social anxiety emphasized that safety-seeking behaviors could maintain or even deteriorate social anxiety over time (Desnoyers et al., 2017). Thus, longitudinal studies are needed to test the reciprocity of the observed relationships in the context of SNSs. Furthermore, although comparing platforms or contexts with different levels of anonymity and publicness is a common ecological way used to explore the impacts of digital affordances, manipulating the affordances of anonymity and publicness may help to obtain a more rigorous association between social anxiety and safety-seeking behaviors (cf., Mao & DeAndrea, 2019). Relatedly, more studies are needed to test whether these findings also exist in a specific SNS platform (e.g., WeChat, Twitter, Instagram), because of the platforms' differences in affordances (Pouwels et al., 2021).

Conclusions

This study provides a more integrated framework, including both personality characteristics (e.g., social anxiety) and contextual factors (e.g., anonymity and publicness of SNS) to understand users' threat perceptions (i.e., evaluative and privacy concern) and safety-seeking behaviors on SNSs. Results from two studies confirmed that social anxiety is positively related to safety-seeking behaviors on SNSs. Both evaluative and privacy concerns mediate this positive relationship, but the mediating role of privacy concern is less potent than that of evaluative concern. Meanwhile, the relationship between social anxiety and safety-seeking behaviors could be context-dependent, which is stronger in SNS contexts with less anonymity and higher publicness. Given the increased risks of SNS environments (e.g., Alkis et al., 2017; Bodford et al., 2021; Shillair et al., 2015), whether safety-seeking behaviors is an adaptive or maladaptive self-regulation process for SNSs users with social anxiety needs to be further examined.

Footnotes

[1] The original Publicness scale includes five items. Given that both WeChat and Qzone afford two different visibility settings (i.e., viewable for different time periods, and public for different audience size), we adapted the original item (*My network can see the content I share*) into two new items (i.e., *My SNS friends can see most of content I've shared in the past* and *Most of my SNS friends can see the new content I shared*) to reflect the duration of the visibility and the size of audience, respectively. Therefore, the publicness scale in the present study consists of six items.

Conflict of Interest

The authors have no conflicts of interest to declare.

Authors' Contribution

Xue-Qin Yin: conceptualization, methodology, data collection, formal analysis, writing – original draft, writing – review & editing. **Sebastian Scherr:** review & editing. **Lin Jin:** investigation, review & editing. **James Gaskin:** review & editing. **Jin-Liang Wang:** conceptualization, methodology, review & editing, supervision.

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