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The bright and dark sides of social media use during COVID-19 lockdown: Contrasting social media effects through social liability vs. social support

Hichang Cho [a,*], Pengxiang Li [b], Annabel Ngien [a], Marion Grace Tan [a], Anfan Chen [c], Elmie Nekmat [a]

[a] *Department of Communications and New Media, National University of Singapore, Singapore*
[b] *School of Journalism and Communication, Minzu University of China, China*
[c] *Chinese University of Hong Kong, Hong Kong*

ARTICLE INFO

ABSTRACT

There exist ongoing discussions regarding whether, when, or why heightened reliance on social media becomes benefits or drawbacks, especially in times of crisis. Using the concepts of social liability, social support, and cognitive appraisal theory, this study examines distinct theoretical pathways through which the relational use of social media has contrasting impacts on cognitive appraisals of and emotional responses to the COVID-19 lockdown. We collected online survey data from 494 social media users in the U.S. during the COVID-19 lockdown. The results based on structural equation modeling (SEM) showed double-edged social media effects. When social media use results in perceived social support, it has a favorable impact on coping appraisals of the COVID-19 lockdown. This, in turn, is associated with lower levels of negative affective responses, such as anger, anxiety, and loneliness. In contrast, when social media use results in increased social liability (i.e., obligation to provide support to others), it negatively impacts cognitive appraisals and affective responses. The study makes significant contributions by unpacking two distinct theoretical mechanisms underlying social media effects: particularly social liability which has been underexplored but was found to be an essential concept to explain the dualistic impact of social media.

1. Introduction

The COVID-19 pandemic has been affecting almost every aspect of human life, including health, work, and social life. In particular, massive-scale lockdowns and stay-at-home orders forced many people to experience unprecedented levels of social isolation, disconnection, and distress (Tull et al., 2020). Many physical activities were banned or shifted online. As a result, people spent more time on social media during the COVID-19 lockdown (Drouin et al., 2020), making social media mainstream channels that dominated information acquisition and social support (Cellini et al., 2020; Saud et al., 2020). A recent survey showed that concerns about the psychological harms of COVID-19 are ranked above those of physical wellbeing (Cowan, 2020). Therefore, it is crucial to fully understand the psychological consequences of a pandemic and associated lockdowns, as well as the role of (social) media in this situation.

Studies examining the social and psychological impacts of social media usage during the COVID-19 pandemic have provided inconsistent and inconclusive findings (Ahmad & Murad, 2020; Cordoș & Bolboacă, 2020; Drouin et al., 2020; Saud et al., 2020). Social media were found to be a source of both social support and anxiety (Drouin et al., 2020) as well as fear (Ahmad & Murad, 2020). Therefore, social media use has a positive effect (Yang et al., 2020) and a negative effect (Pennington, 2021) on subjective wellbeing during the COVID-19 pandemic. Similarly, previous studies that examined the social media effects in other contexts have produced mixed findings, such as positive impacts on social capital and psychological wellbeing (e.g., Ellison et al., 2007; Pang, 2018) as well as negative consequences like negative social comparison, depression, and psychological stress (e.g., Lup et al., 2015; Marino et al., 2018). Overall, the results indicate that the impact of social media on users' psychological wellbeing can vary depending on the differential underlying processes involved. However, whether, when, or why increased dependence on social media is a source of harm or benefit remains ambiguous (Maier et al., 2015; Taylor & Bazarova, 2018). The investigation of social media's amplified and dualistic roles has become a critical topic of interest due to its potential implications for

individuals' social psychological experiences during the COVID-19 pandemic. For instance, individuals experienced high levels of anxiety, stress, and loneliness during the COVID-19 pandemic and lockdowns (Cielo et al., 2021), prompting many to turn to social media to maintain daily routines and social connections (Drouin et al., 2020). Likewise, a recent large-scale survey revealed a sharp increase (about 20%) in worldwide social media usage compared to before the pandemic (Dixon, 2022). The pandemic has thus heightened the importance of examining the effects of social media usage on individuals' well-being and social functioning (Lee et al., 2022). Consequently, an exploration of the potential positive and negative consequences of social media usage during the pandemic is both theoretically and practically vital.

To address this research gap and aim, we conduct a study with a novel, refined theoretical approach. Specifically, we unpack two theoretically distinct mechanisms related to social capital (i.e., social support and social liability) through which social media use has contrasting social-psychological impacts. On the one hand, we predict that expanded social networks via social media should have a positive impact by increasing social support and social capital through network-based resource exchanges. On the other hand, we argue that social media use also has a negative impact because social networks entail social liability (Gabbay & Leenders, 1999; Gargiulo & Benassi, 1999; Hansen et al., 2001; Kroenke et al., 2006) when people feel obligated to provide support to network ties. Surprisingly, most studies on social media have been one-sided, focusing on the former (i.e., gains through expanded social support) but rarely examined the alternative process (i.e., loss due to increased social liability and network constraints) through which social networks via social media can have contrasting implications. Therefore, this study proposes distinguishing between social support and social liability and examining these distinct (and potentially competing) mediating mechanisms simultaneously.

The overall goal of this study is to advance our understanding of the theoretical mechanisms underlying social media effects. In particular, this study extends its focus to the concept of social liability which has been underexplored but can be an essential construct to explain the dualistic impacts of social media and social networking. Practically, the findings can also provide useful insights into how to mitigate or maximize the promises or pitfalls of social media use, especially during times of crisis and unrest, such as the COVID-19 lockdown.

The present study tests a theory-driven research model and hypotheses using survey data (n = 494 active social media users) collected during the COVID-19 lockdown period in the U.S. (May 2020). Among the multiple functions of social media, we focus on the social/relational use of social media (e.g., Facebook, Instagram, Twitter)[1] given the present study's focus on network effects through social relationships (i.e., social support vs. liability) during the lockdown. The remainder of this study is organized as follows. First, we begin with a review of social media usage during the COVID-19 pandemic and cognitive appraisal theory (Lazarus & Folkman, 1984), which guides the development of a baseline research model and hypotheses specifying the relationship between cognitive appraisals of and emotional responses to the COVID-19 lockdown. Next, we review previous studies on social media, social support, and social liability and develop hypotheses specifying distinct routes through which social media usage affects psychological outcomes through its effects on the main constructs in the cognitive appraisal theory framework. This is followed by the descriptions of the method and results and the discussion of the theoretical and practical implications of the findings.

2. Literature review

2.1. Social media usage, emotional wellbeing, and COVID-19

The relationship between social media use and emotional health has long been debated, though current findings have given rise to mixed and inconclusive results (Sharma et al., 2020). The 'digital media harm' perspective argued that social media has detrimental impacts on users' mental health (Orben & Przybylski, 2019), while other scholars posited that social media offers greater opportunities for maintaining existing relationships, finding new contacts, and participating in online communities, thus improving emotional wellbeing (Bessière et al., 2010). This dualistic effect of digital media on mental health is similarly reflected during social media use during global health emergencies. For instance, recent research carried out during the COVID-19 pandemic confirms that many turned to social media to seek both emotional and practical social support (Lisitsa et al., 2020), and the use of social media was positively associated with subjective wellbeing (Saud et al., 2020). Other studies reported similar findings, with social media use during COVID-19 improving subjective happiness and self-rated mental health (Khodabakhsh & Ahmadi, 2021; Lee & Jang, 2022) and reducing stress (Ngien & Jiang, 2021). On the other hand, increased use of social media during the COVID-19 pandemic is also associated with self-evaluated depression and anxiety in various cultures (Ahmad & Murad, 2020; Alrasheed et al., 2022; Gao et al., 2020). Another study by Brailovskaia et al. (2022) found that COVID-19-related social media use is positively related to the psychological burden of the pandemic. These mixed results are captured in a systematic review by Marciano et al. (2022) that concluded it is not clear whether digital media use during COVID-19 can improve or harm psychological wellbeing. The seemingly mixed relationship reveals that the association between social media use during global pandemics and emotional wellbeing is multi-faceted and requires further investigation (see Table 1 for a summary).

These mixed results can be explained by two key reasons. First, there is a lack of study on the *indirect* (i.e., mediated) effects of social media use on psychological wellbeing during the COVID-19 pandemic. Most studies only examine the *direct* effects, which ignores the complex and diverse ways in which digital media can affect people's emotional health (Street, 2003). Scholars have argued that it is crucial to identify the indirect influence of media use on wellbeing, as without mediators, it is difficult to understand why particular outcomes fail to emerge or operate effectively in certain contexts (Merton, 1986; Street, 2003). Second, there is a lack of theory-driven approach in previous studies to understand the dualistic and mixed effects of social media use on emotional wellbeing. Theoretical frameworks can better demonstrate the 'why' or 'how' of the relationship, which is especially crucial to understand in health or psychological wellbeing research as the identification of specific relationships can help to concentrate focus on certain therapeutic aspects that increase wellbeing, while discarding others that may be irrelevant (Kazdin, 2007). To address these gaps, we employ the cognitive appraisal theory and two potentially opposing theoretical mechanisms (via social support vs. social liability) to explicate the distinct processes through which social media usage has dualistic effects. The rationale for using the theoretical framework and concepts is elaborated in subsequent sections.

Table 1

Studies on Social Media Use during COVID-19 and its Impact on Mental Health.

Social Media Use during COVID-19 and its Impact on Psychological Outcomes	
Pros of social media use	Cons of social media use
- Increased social support and reduced loneliness (Lisitsa et al., 2020; Saud et al., 2020)	- Heightened feelings of COVID-19-related panic (Ahmad & Murad, 2020)
- Improved subjective happiness (Khodabakhsh & Ahmadi, 2021)	- Increased anxiety (Gao et al., 2020)
- Improved self-related mental and physical health (Lee & Jang, 2022)	- Enhanced psychological burden of COVID-19 (Brailovskaia et al., 2022)
- Reduced feelings of fatalism and stress (Ngien & Jiang, 2021)	- Increased depressive symptoms (Alrasheed et al., 2022; Lee et al., 2022)

2.2. Cognitive appraisal theory: appraisals and emotions in aversive situations

Cognitive appraisal theory (CAT) specifies the role of cognitive appraisals in determining affective responses and coping strategies, especially those related to aversive situations (Lazarus, 1991; Lazarus & Folkman, 1984; Seimer et al., 2007). According to CAT, it is the personal interpretation of the situation, rather than the situation itself, that creates the intensity and quality of emotional responses and coping strategies (Lazarus & Folkman, 1984). Therefore, people display distinct emotional and behavioral responses to the same situation due to different cognitive appraisals. This aligns with cognitive theories of emotion (Lazarus, 1991; Scherer, 2001), stating how an event is interpreted across a range of dimensions (e.g., importance, expectedness, goal conduciveness, controllability of an event) determines subjective and distinct emotional experiences.

2.2.1. Threat appraisals, coping appraisals, and discrete emotions

According to CAT, two types of cognitive appraisals, threat appraisals and coping appraisals, play a crucial role in determining affective responses to stressful and risky situations, such as the COVID-19 lockdown (Lazarus & Folkman, 1984). Threat appraisals refer to the assessment of physical or psychological danger or threat. Perceived vulnerability and perceived severity of threats typically represent threat appraisals, which determine the degree to which a situation is perceived to be central, important, and relevant. Coping appraisals refer to our assessment of resources and options to cope with the situation (Folkman et al., 1986). Factors include response efficacy (i.e., the effectiveness of protective behavior), self-efficacy (i.e., perceived capability to perform the behavior), and response cost (i.e., costs arising from the protective method) (Lazarus, 1991; Lazarus & Folkman, 1984), which determine how well a person believes he or she can cope with the aversive situation.

Advocates of CAT further theorize that threat appraisals are associated with high negative affect, whereas coping appraisals are linked to positive affect or low negative affect (Lazarus, 1991; Lazarus & Folkman, 1984). Threat appraisals result in negative emotions, such as anger, frustration, anxiety, or fear because of their focus on the potential harm to the self (Balzarotti & Ciceri, 2014; de Hoog & Verboon, 2020).

Studies employing the CAT framework also showed how coping appraisals are associated with discrete emotions. Perceived uncontrollability is likely to result in fear or anxiety (Lerner et al., 2013). Perceived uncontrollability also leads to anger towards entities (e.g., governments, organizations) whom the individual perceives to be responsible for causing or not dealing with the adversity (Coombs & Holladay, 2005). On the other hand, for those with positive coping appraisals, the belief that one can cope effectively with aversive situations reduces negative emotional responses because the situations can be avoided or controlled (de Hoog & Verboon. 2020).

Drawing on the CAT framework, this study formulates baseline hypotheses, identifying key psychological outcomes related to the COVID-19 lockdown and predicted associations between them. Specifically, we examine how threat appraisals and coping appraisals related to the COVID-19 lockdown lead to three discrete negative emotions: anger, anxiety, and loneliness. Anger and anxiety were chosen as they are common emotional reactions under aversive or threatening situations (Lazarus & Folkman, 1984), including quarantines and lockdowns (Brooks et al., 2020). Though loneliness is not a typical emotional state examined under the CAT framework, this study also focuses on loneliness, given that it is one of the essential emotional experiences under the COVID-19 lockdown (Luchetti et al., 2020). Notably, previous literature shows that loneliness is more than being physically alone; its experience is heavily dependent on personal perception, beliefs, and biases, which are all involved in the cognitive appraisal process under CAT (Hawkley & Cacioppo, 2010; Rodriguez et al., 2020). Hence, we predict the following hypotheses.

H1. Threat appraisals of the COVID-19 lockdown will be positively associated with negative emotional responses, such as anger (H1a), anxiety (H1b), and loneliness (H1c).

H2. Coping appraisals of the COVID-19 lockdown will be negatively associated with negative emotional responses, such as anger (H2a), anxiety (H2b), and loneliness (H2c).

2.3. Social media, cognitive appraisals, and emotional outcomes

As noted earlier, we propose two potentially opposing theoretical mechanisms (via social support vs. social liability) to explicate the distinct processes through which social media usage has dualistic effects on cognitive appraisals and emotional outcomes.

2.3.1. Positive effect of social media via perceived social support

Social networking, relationship maintenance, and the expansion of network ties are the main functions of social media (Ledbetter, 2021). Given lockdown restrictions that limit in-person interaction, many individuals rely on social media as one of the main communication channels to connect with others (Cellini et al., 2020; Drouin et al., 2020; Lisitsa et al., 2020). This behavior is a manifestation of Weiss' (1973) social provision theory which postulates that individuals seek specific forms of social provision to avoid social isolation and loneliness, especially under aversive situations. Weiss describes six types of social-support provisions: attachment, reassurance of worth, social integration, sense of reliable alliance, opportunity of nurturance, and the obtaining of guidance. Social media provides many avenues for these desires to be met. Most obviously, social media provides a means of communication that transcends time and space, thus allowing individuals to feel secure in their relationships and giving them a means to seek help and social support despite physical restrictions. Furthermore, social media consists of several tools, such as "liking" and "favoriting," that permit a large number of people to show social support easily (Carr et al., 2016), acting as a reassurance of worth. In sum, the social/relational use of social media should be associated with higher levels of perceived social support, defined as individuals' confidence that adequate social support would be available (Barrera, 1986). Hence, we predict that.

H3. Social media use for social relationships under the COVID-19 lockdown will have a positive association with perceived social support.

Social support through social networks provides many benefits to individuals. For example, informational support (e.g., advice-giving, providing suggestions), emotional support (i.e., expression of empathy, trust, and care), and instrumental support (i.e., providing tangible support) motivate people to better prepare for unfavorable situations and reduce their sense of uncertainty (Shannon & Lee, 2008). Social support via social networks may also act as a "social cushion" or "buffer" and thus affects cognitive appraisals of stressful events. For example, perceived social support attenuates the perceived severity of a threatening event and the perceived probability of its occurrence (Dworkin et al., 2018).

With regards to coping appraisals, perceived social support functions as a resilience factor, encouraging adaptation and adjustment in an aversive situation (Tak & McCubbin, 2002). For example, Major et al. (1990) found those who perceived sufficient support from their family, friends, and partners had higher self-efficacy for coping with trimester abortion. In online contexts, Wright (1999) revealed that perceptions of supportive online relationships are predictive of coping strategies. In particular, in the context of the COVID-19 lockdown, the feelings of increased social support and of being together are found to be positively associated with resilience in response to COVID-19 (Luchetti et al., 2020). Hence, we posit.

H4. Perceived social support will be negatively associated with (H4a) threat appraisals and positively associated with (H4b) coping appraisals.

2.3.2. *Negative effect of social media via social liability*

Though most previous studies have focused on positive network effects through social capital or social support, several pointed out that "social bonds may at times hinder, rather than help, an actor's ability to pursue his interests" (Gargiulo & Benassi, 1999, p. 299). There is convincing evidence that embeddedness in social networks is not inherently good; its value and utility depend on its interaction with a person's unique circumstances (Gabbay & Leenders, 1999; Kroenke et al., 2006). For example, organizational studies have found social networks that yielded positive social capital in some task situations convey social liability in other conditions, impeding managers' operation, adjustment, and adaptation, especially in times of disruptive change, discontinuity, and uncertainty (Gargiulo & Benassi, 1999; Hansen et al., 2001).

Given the sudden and unique circumstances the COVID-19 pandemic and associated lockdowns have put people in, it is likely the lockdown presents individuals with unprecedented challenges and discontinuity. Thus, the resultant needs and issues of those impacted may or may not be met by social structures that were previously efficacious. Further, increased social media use during the COVID-19 lockdown makes individuals aware of more people who are in trouble, needing more social, emotional, and instrumental support. This may lead to feelings of social liability as well as network constraints.

The concept of social liability stems from the reciprocal nature of human relationships (Gabbay & Leenders, 1999; Gargiulo & Benassi, 1999). From the perspective of social exchange theory (Blau, 1964; Cook & Rice, 2003), both parties must reciprocate for relationships to be preserved. Failing to do so will result in significant losses and sanctions. Hence, social liability describes a sense of obligation in maintaining social relations. Although large networks have the potential to provide large amounts of social support and resources, the need to reciprocate this support can be stressful and emotionally taxing, causing harmful effects that threaten wellbeing (Kroenke et al., 2006). Similarly, in the interpersonal communication context, increased use of a mobile phone in close friendships has negative consequences such that it leads to feelings of over-dependence, entrapment, and dissatisfaction in relationship management (Hall & Baym, 2012).

Generally, previous studies attribute detrimental network effects to the physical, behavioral, and mental constraints posed by ineffective social relations on individual goal attainment (Gabbay & Leenders, 1999; Portes, 1998). The maintenance of social ties and thus capital come at a cost; one must invest energy and time, potentially at the expense of personal gain, to preserve good relations with others. Because individuals have limited energy and time, there is a limit to the size of our social networks. Putting in effort in relationships that hinder and constrain people not only pilfers their efforts but also creates social liability and network constraints (Gabbay & Leenders, 1999) that further burden and restrict them. Such negative relations are social liabilities as they might impose exorbitant demands (behavioral, social, or psychological) on an actor, restrict opportunities to create new social capital, limit possibilities for self-gain, restrict personal freedom, and prevent innovation in problem-solving (Pillai et al., 2017), while simultaneously imposing a cost on the actor to conserve these relations.

In the context of social media, several studies have examined a similar phenomenon using the concept of social overload (Cao & Sun, 2018; Maier et al., 2015; Zhang et al., 2020). It refers to a negative perception of social media usage when users receive too many social support requests (e.g., reaction, assistance, and support) and feel they are giving too much social support to other individuals in their virtual social network (Maier et al., 2015). When social media users feel a sense of duty to bear the burden of caring about other users' issues, social support is transformed into social overload (Choi & Lim, 2016), and the costs outweigh the benefits. Studies showed social overload on social media results in exhaustion, fatigue, and the discontinuance of technology use (Cao & Sun, 2018; Maier et al., 2015; Zhang et al., 2020). While these recent studies made preliminary steps to explore negative social media effects, most studies investigated their direct impacts on classical outcomes related directly to technology use, such as dissatisfaction or discontinuance (Cao & Sun, 2018; Maier et al., 2015; Zhang et al., 2020). Therefore, it remains unknown if social overload leads to adverse social-psychological outcomes in broader social contexts. Further, while the concept of social overload focuses on the state of 'excessive' social networking and demands, social liability is conceptually broader and thus more suitable for the present study because it is assumed that the same network structure (regardless of its size or density) can be social capital and/or social liability due to changing situations or tasks (Hansen et al., 2001).

In sum, the literature reviewed above suggests social networks and social-support relationships come with costs and liabilities, which may hold true in the context of the COVID-19 lockdown. Increased reliance on social media during the COVID-19 pandemic might come to feel burdensome when the demands of handling social connections via social media constrain people's interaction ability. In addition, individuals feel an increased responsibility to be a source of support for network ties who are struggling during times of crisis. This might have a detrimental effect on the perceived capacity to cope with the COVID-19 lockdown. As the social liability literature suggests, existing social networks can be perceived as a barrier to adaptation and adjustment. Anticipated failures to adapt to environmental challenges lead to fear and anxiety (Sedikides et al., 2015). Similarly, people perceive that risk is severe when they feel that they have difficulty coping with the aversive situation (Lerner et al., 2013). Taken together, when increased dependence on social media results in perceived social liability, coping appraisals are hindered, and threat appraisals are more likely. Given the aforementioned pieces of evidence, this study predicts.

H5. Social media use for social relationships under the COVID-19 lockdown will have a positive association with social liability.

H6. Social liability will be positively associated with threat appraisals (H6a) and negatively associated with coping appraisals (H6b).

Taken together, H1 to H6 suggest that social media usage should have contrasting effects depending on how its effects are mediated. Specifically, social media usage is predicted to involve inconsistent mediation effects such that:

H7a-b. When mediated by perceived social support, social media usage will have favorable impacts (H7a), whereas unfavorable impacts when mediated by social liability (H7b).

Fig. 1 visually depicts the overall research model. As shown, this study proposes a refined research model that unpacks two distinct theoretical mechanisms through which social media use during the COVID-19 lockdown has contrasting implications on cognitive and emotional responses, using the CAT as a baseline framework.

3. Method

3.1. *Sample and procedure*

The data for this research was collected through an online survey in May 2020 in the U.S. In particular, the survey was conducted in the states of California, Illinois, and New York as the three states were most severely affected among others, and thus enacted full lockdown (mandatory state-wide 'Stay-Home-Order') at the time of data collection. It was deemed that the COVID-19 lockdown provides a unique context to investigate the contrasting roles of social media in times of crisis. Participants were recruited from Qualtrics' online panelists containing about 6 million panelists. The eligibility of participation was regular social media users (visiting social media platforms like Facebook, Twitter, or Instagram at least once in two weeks) who were older than 18 years. Quota sampling, based on age and gender, was employed to match the proportion of selected participants to social media users.
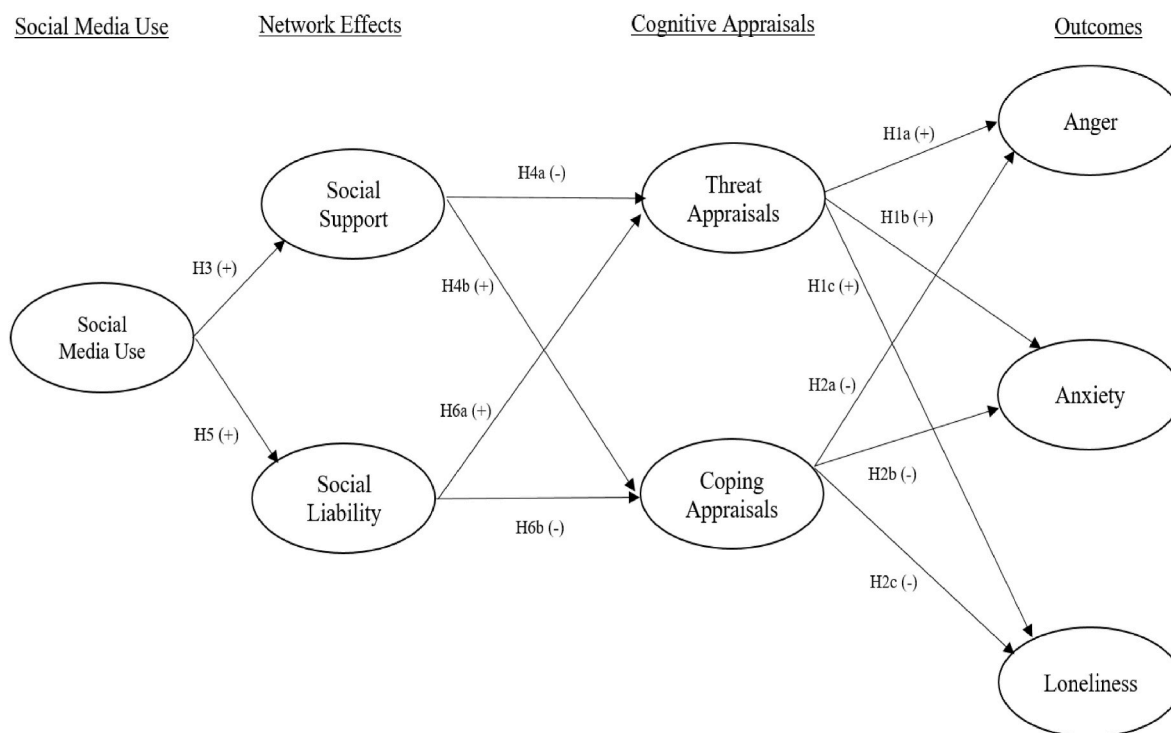
Fig. 1. Research model and hypotheses.

Specifically, we employed the U.S. Facebook user profile as a benchmark for quota sampling.

After eliminating unreliable answers (e.g., those who failed to give the correct answer for two attention-check questions), a total of 494 participants (n = 184 in California; n = 120 in Illinois; n = 190 in New York) were included in the final data analysis. Among them, 257 were female (52.02%), and the average age of participants was 45.85 (SD = 17.12).[2]

3.2. Measures

This study employed measures that have been validated in the existing literature and were reliable (Cronbach's alphas >.70, ranging from 0.76 to 0.92). All measures were based on a seven-point Likert scale, except for *social media use* which was based on a five-point Likert scale. Table 2 reports measures, items, and descriptive statistics.

3.2.1. Social media use for social relationship

Social media use for social relationships was measured with a four-item scale (M = 3.43, SD = 1.05, α = 0.86), adapted from previous studies (e.g., Muscanell & Guadagno, 2012). It assessed the extent to which individuals relied on social media (e.g., Facebook, Instagram, Twitter) for social and relational purposes (e.g., "… to stay in touch with acquaintances, friends, and family") for the past two months during the COVID-19 lockdown. People tend to overestimate the duration or frequency of social media or Internet use (Scharkow, 2016; Verbeij et al., 2021). Further, media dependency to meet their relational needs during the COVID-19 lockdown was deemed more important than the time spent on social media in the context of the present study. Hence, we assessed social media use in terms of media dependency instead of frequency/duration.

3.2.2. Threat appraisals and coping appraisals

Threat appraisals of COVID-19 lockdown (M = 4.89, SD = 1.23, α = 0.80) were measured with a five-item scale adapted from Peacock and Wong (1990). The chosen items included: "it [COVID-19 lockdown] is a threatening situation" and "it has negative impacts on me." Coping appraisals of COVID-19 lockdown (M = 5.61, SD = 0.95, α = 0.76) were also adapted from Peacock and Wong (1990). It was measured with four items, including "I have the ability to be well during this lockdown period."

3.2.3. Perceived social support and social liability

Both measures were modified from Cutrona and Russell (1983). In particular, *perceived soc*ial support (M = 5.60, SD = 1.18, α = 0.82) was measured with four items, including "I feel part of a group of people who share my attitudes and beliefs," and "I have close relationships that provide me with a sense of emotional security and wellbeing." *Perceived social liability* (M = 5.08, SD = 1.38, α = 0.79) was measured with another four items, such as "there are people who depend on me for help" and "I feel personally responsible for the wellbeing of another person."

3.2.4. Emotional outcomes

Participants were asked to indicate their emotional reactions to the COVID-19 lockdown. Three types of negative emotional reactions—*anger, anxiety,* and *loneliness*—were assessed. A three-item scale was borrowed from Gelbrich (2010) to measure *anger* (M = 3.65, SD = 1.68, α = 0.88), and a four-item scale was employed to measure *anxiety* (M = 4.14, SD = 1.65, α = 0.92), modified from Campbell-Sills et al. (2006). *Loneliness* (M = 3.70, SD = 1.91) was measured by a single item adapted from Victor et al. (2005).[3]

3.3. Data analysis

We performed structural equation modeling (SEM) analyses to test the research model and hypotheses using M*plus* version 7.4.

4. Results

First, the measurement model was examined using the confirmatory factor analysis (CFA) approach. The results of CFA indicate that eight

Table 2
Measures, items, and descriptive statistics.

Variables	Items	M(SD)	α
Social media use for social relationship	In the past two months during the COVID-19 lockdown, how important was social media (e.g., Facebook, Instagram, Twitter) for you … To stay in touch with acquaintances, friends, and family To find out what acquaintances, friends, and family are doing To share your personal experience and opinions with others To share news with others	3.43 (1.05)	.86
Threat appraisal	Please indicate the degree to which you agree or disagree with the following statements about the COVID-19 lockdown. It is a threatening situation It has negative impacts on me It has important consequences for me It has serious implications for me It will have long-term consequences on me	4.89 (1.23)	.80
Coping appraisal	I have the ability to be well during this lockdown period I will overcome problems in the current situation I have skills necessary to cope with this situation There are resources available to cope with this situation	5.61 (.95)	.76
Perceived social support	I feel part of a group of people who share my attitudes and beliefs I have close relationships that provide me with a sense of emotional security and wellbeing I feel a strong emotional bond with at least one other person There are people I can count on in an emergency	5.60 (1.18)	.82
Perceived social liability	There are people who depend on me for help I feel personally responsible for the wellbeing of another person There is no one who really relies on me for their wellbeing (Reverse coding) No one needs me to care for them (reverse coding)	5.08 (1.38)	.79
Anger	Please think about your daily life for the past few days and how the COVID-19 lockdown has negatively or positively affected you. How do you feel about it? I feel angry I feel mad I feel annoyed	3.65 (1.68)	.88
Anxiety	I feel anxious I feel nervous I feel fearful I feel scared	4.14 (1.65)	.92
Loneliness	I feel lonely	3.70 (1.92)	–

latent factors in the research model (see Fig. 1) had adequate measurement validity (χ^2 [346] = 832.157, $p < .001$; CFI: 0.938; TLI: 0.928; RMSEA: 0.053 [90% C.I.]: 0.049, 0.058). All indicators loaded significantly with their respective latent factors, and all standardized factor loadings were above the conventional cutoff (>0.50) except for one indicator (0.453) for threat appraisal. The average variance extracted (AVE) ranged from 0.573 to 0.736, which was above the cutoff (>0.50), showing sufficient convergent validity. Exceptions were the threat appraisal factor, coping appraisal factor, and the social liability factor for which the AVE was 0.465, 468, and 0.447, respectively. The coefficients were very close to the cutoff, and the three factors had high-

reliability scores ($\alpha > 0.76$). Further, the overall model fit indices for the measurement model were adequate. The values of the square root of the AVE were higher than the value of the factor correlation, indicating adequate discriminant validity. Therefore, all variables were retained in the research model.

Next, the structural model containing seven hypotheses was examined. Fig. 2 summarizes the final SEM results. The research model had an acceptable range of model fit (χ^2 [358] = 917.714, $p < .001$; CFI: 0.929; TLI: 0.919; RMSEA: 0.056 [90% C.I.]: 0.052, 0.061). We began with testing the baseline hypotheses based on CAT. H1 predicted that threat appraisals would be positively associated with negative emotions, namely anger (H1a), fear/anxiety (H1b), and loneliness (H1c). The results indicate that threat appraisals were positively associated with anger ($\beta = 0.312$, $p < .001$), anxiety ($\beta = 0.471$, $p < .001$), and loneliness ($\beta = 0.280$, $p < .001$). Hence, H1a, b, & c were supported.

H2 predicted that coping appraisals would be negatively associated with negative emotions, such as anger (H2a), anxiety (H2b), and loneliness (H2c). The results showed that coping appraisals had a negative association with anger ($\beta = -0.215$, $p < .001$), fear/anxiety ($\beta = -0.250$, $p < .001$), and loneliness ($\beta = -0.323$, $p < .001$). Hence, H2a-c were supported.

H3 predicted that social media use for social relationships would have a positive association with perceived social support, which, in turn, would have a negative impact on threat appraisals (H4a) and a positive impact on coping appraisals (H4b). The results showed social media use had a positive relationship with perceived social support ($\beta = 0.237$, $p < .001$). Hence, H3 was supported. The results also supported both H4a and H4b in that perceived social support had a negative association with threat appraisals ($\beta = -0.247$, $p = .002$) and a positive association with coping appraisals ($\beta = 0.703$, $p < .001$).

It was hypothesized that social media use would also be positively associated with social liability (H5), which would have negative implications for cognitive appraisals (H6a-b). Specifically, we predicted that perceived social liability would be positively associated with threat appraisals (H6a) and negatively with coping appraisals (H6b). As Fig. 2 shows, the path between social media and social liability was positive and significant ($\beta = 0.356$, $p < .001$). Therefore, H5 was supported. The path between social liability and threat appraisals was positive and significant ($\beta = 0.336$, $p < .001$), whereas the path between social liability and coping appraisals was negative and significant ($\beta = -0.183$, $p = .018$). Therefore, H6a and H6b were supported.

Finally, the results based on bootstrapped estimates (n = 5000 resampling) and confidence intervals (C. I.) showed the indirect effects predicted in our research model were significant. As predicted by H7a, when mediated by social support, social media use had favorable indirect impacts by reducing threat appraisals (β indirect = -0.059; 95% C. I.: -0.111, -0.017) and enhancing coping appraisals (β indirect = 0.167, 95% C. I.: 0.074, 276), which, in turn, led to reduced negative affective responses. In contrast, when mediated by social liability (H7b), social media usage had detrimental indirect impacts on threat appraisals (β indirect = 0.120, 95% C. I.: 0.044, 0.226) and coping appraisals (β indirect = -0.065, 95% C. I.: -0.144, -0.002), which, in turn, led to high levels of negative emotions. In sum, the results supported all hypotheses in our research model.

5. Discussion

This study examines the relational use of social media during the COVID-19 lockdown in the U.S. and investigates its contrasting impacts using the concepts of social support and social liability. In summary, the findings show that social media usage has double-edged effects. When social media usage is associated with increased perceived social support, it has a favorable impact on cognitive appraisals, which, in turn, is associated with lower levels of negative emotional responses, such as anger, anxiety, and loneliness. In contrast, when social media usage results in perceived social liability, it is associated with higher levels of
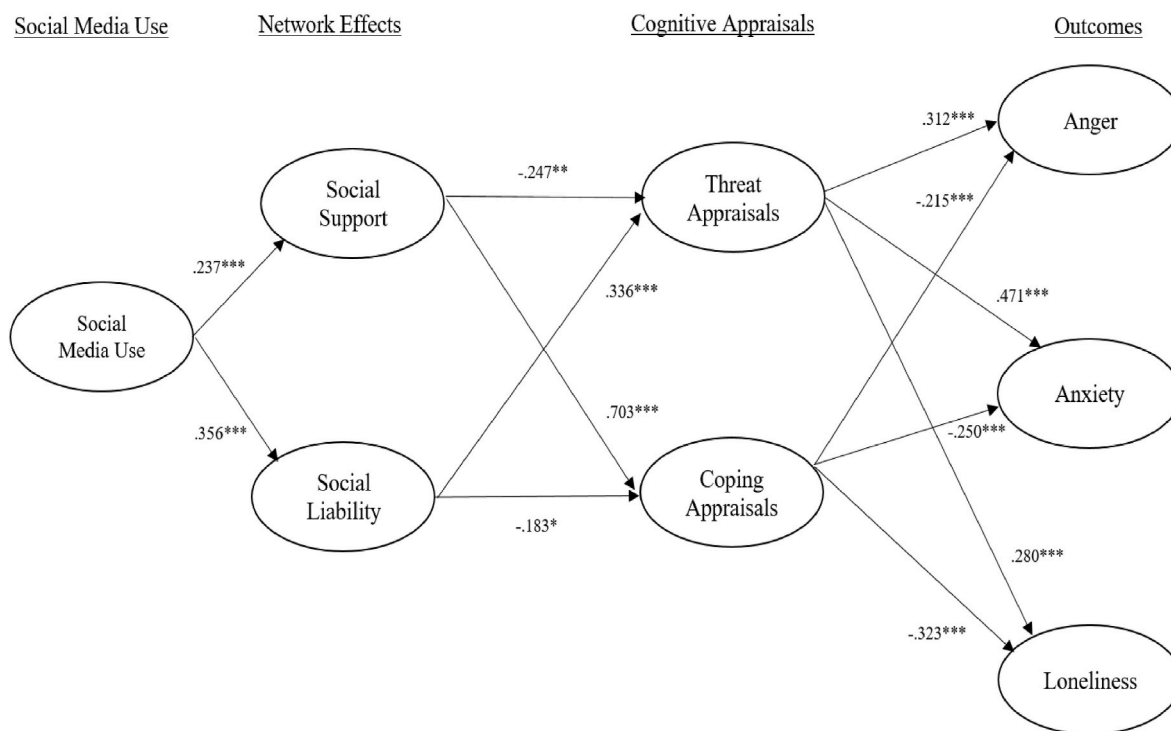
Fig. 2. Results of SEM Analysis
*p < .05, **p < .01, ***p < .001.

negative emotions through its detrimental effects on cognitive appraisals. The study makes significant theoretical contributions by demonstrating two distinct mechanisms underlying social media effects. By distinguishing between two contrasting underlying processes (i.e., social support vs. social liability), we specified the conditions under which social media usage has a positive or negative association with psychological outcomes. Further, by employing CAT as a guiding framework, this study unpacks how these relatively underspecified mechanisms influence different aspects of cognitive appraisals and emotional consequences in times of crisis, such as the COVID-19 lockdown.

The findings provide several important implications for research. First, the findings underscore the value of the social liability concept in advancing our understanding of social media effects. Though the concept of social liability is not entirely new in social network research, previous studies have examined it in organizational settings (Gabbay & Leenders, 1999; Gargiulo & Benassi, 1999; Hansen et al., 2001). Whether social liability exists and operates in the same way in computer-mediated social networks is a theoretical question that has yet to be empirically examined. From the perspective of social exchange theory, social media can be an ideal platform because it provides an opportunity to maintain social relationships with relatively low costs and high returns compared to offline settings (Surma, 2016). Accordingly, many previous studies have highlighted positive aspects of social media, such as social capital (e.g., bridging social capital and bonding social capital) and social support (Chen & Li, 2017; Ellison et al., 2007). Similarly, several studies have demonstrated that social media usage during the COVID-19 pandemic can be beneficial because social media serves as a constructive coping strategy through which people reduce feelings of anxiety and loneliness (Cauberghe et al., 2021). However, the present study shows that increased reliance on social media during physical isolation and social distancing can also be a source of harm and distress. Though existing literature also found the negative consequences of social media usage during the COVID-19 pandemic (Ahmad & Murad, 2020; Alrasheed et al., 2022; Gao et al., 2020), few studies have identified mechanisms underlying such negative social media

effects. The findings demonstrate that the concept of social liability is crucial in unpacking the alternative process underlying the detrimental network effect via social media. Given that the concept of social liability has been underexplored in social media research, the present study suggests a crucial step in advancing our understanding of complex social media effects.

Notably, we also find that social media usage does have a positive impact on psychological outcomes via social support. The findings are generally consistent with previous studies that demonstrated the positive effect of social media via expanded social capital or social provision (Ellison et al., 2007; Pang, 2018), including in the context of the COVID-19 pandemic (Gloster et al., 2020). The findings suggest that social media could be a compensatory tool to satisfy the unmet social needs during the COVID-19 pandemic and associated lockdowns. Specifically, online social interaction, self-disclosure in the context of mutual online friendship, and positive and supportive feedback through online social networks can mitigate feelings of loneliness and anxiety during the COVID-19 pandemic (Marciano et al., 2022).

Overall, the findings suggest two opposing mediating mechanisms (through social support vs. social liability) that can help explain the mixed findings regarding the socio-psychological impacts of social media observed in previous studies (e.g., Cauberghe et al., 2021; Gao et al., 2020). The present study makes a unique contribution to the literature by explicating both mechanisms simultaneously. An important question is whether two states (i.e., social support vs. social liability) are opposing conditions of a bipolar continuum, and people thereby experience either social capital benefits or social liability. Most previous studies about social overload take this approach by assuming that excessive social support and connections through social media transform into social overload (Cao & Sun, 2018; Maier et al., 2015). However, the results of this study suggest otherwise. To recap, the measurement model test shows that these two factors are conceptually related but distinct. The correlation between them was positive (r = .586) rather than negative. In other words, the findings indicate that individuals can experience both social support and social liability concurrently. Each state's preponderance appears to determine whether

the total effect is positive, negative, or neutral (nonsignificant). As such, the findings suggest the importance of distinguishing between the two concepts and examining both mechanisms that might be simultaneously operating. Otherwise, researchers' focus on only one process may result in incomplete or even invalid conclusions about the social media effects as the results would stress either a primarily positive or a primarily negative effect depending on which aspect (social support vs. social liability) is selectively examined. Similarly, the aggregation of theoretically distinct concepts and mechanisms into a simplified research model can result in the loss of predictive power or obscure meaningful findings as inconsistent and opposing effects would offset each other. In short, we argue that any conclusions about the positive, negative, or nonsignificant social media effects should be verified with more thorough examinations of competing theoretical mechanisms involved.

Second, the present study proposes an integrative approach that combines social media effect research, the concepts of social support/liability, and the CAT framework. Using this approach, this study identifies key theoretical constructs and mechanisms that are central to understanding the social-psychological impacts of social media usage, particularly in times of crisis like the COVID-19 pandemic. We propose that the use of the CAT framework offers useful ways of accurately understanding multifaceted social media effects and related theoretical concepts. For example, previous studies have suggested providing social support to others (operationalized as a social liability in this study) is associated with the concept of the opportunity for nurturance, which should have a positive impact on psychological wellbeing (Weiss, 1974; Kvaal et al., 2013). With the opportunity of nurturance, people perceive they are an integral part of a community as they can make valuable contributions. Indeed, classical social provision studies have posited that social provisions consist of both elements (social support fro*m* and *to* others) and predicted they have consistent (positive) effects (Weiss, 1974). However, the present study's findings show that these two factors, although positively correlated with each other, have contrasting implications on emotional outcomes through their differential impacts on two specific cognitive processes: threat appraisals and coping appraisals. We suggest that the refined and integrative research model proposed in this study would help disentangle complex mechanisms underlying social media effects.

Theoretically, the research model presented in this study provides a useful analytical framework that can be reused in subsequent studies to investigate the dualistic social media effects in different social contexts. Specifically, the current study demonstrates when or how the increased dependence on social media has positive or negative psychological impacts via two contrasting underlying processes. Notably, the findings of this study are based on a specific social context (i.e., the COVID-19 pandemic). Nonetheless, we argue the distinct theoretical mechanisms found in this study should be applicable to other social contexts in which both mechanisms are likely to operate simultaneously and play important roles (for example, organizations or communities with disruptive changes).

Practically, the findings provide insights into how to maximize the benefits of social media use and minimize negative effects. For example, individuals perceive that the aversive lockdown situation is more severe and cannot be effectively solved when they feel that many people around them are also in trouble and demand social support (i.e., social liability). Further, such negative sentiments about the COVID-19 pandemic can be contagious and quickly penetrate online networks through social media, which can lead to collective mental challenges (Valdez et al., 2020). Practitioners and caregivers should recognize this problem to come up with an effective countermeasure for it. When embedded in a large social network, perceived social liability can be overwhelming as an individual is typically connected to numerous others. In social media, however, social-support exchanges between others/alters (i.e., friends) are often invisible to an ego (the self) when others engage in dyadic or private communication modes. Enhancing the visibility of social support between social media users would help

reduce perceived social liability. Online communities of support and helplines can be recommended via social media so people can feel that adequate support to others is readily available through many resources.

5.1. Limitations and directions for future research

The present study has limitations that suggest directions for future studies. First, the findings are based on cross-sectional survey data. As such, the results should be interpreted with caution. For example, the relationship between social media use and cognitive appraisals could be reciprocal in that those who perceive high threats are more likely to use social media to seek out social support from other users. In this study, we measured individuals' past social media use (e.g., "in the past two months, …") and their current perceptions and emotional states (e.g., "it is a threatening situation") to establish the temporal precedence of a predictor. As such, we ruled out reverse causation to a certain extent. Nonetheless, we suggest future studies employ a longitudinal approach to verify further the findings observed in this study.

Second, we collected data in three chosen states in the U.S.: California, Illinois, and New York, because these three states were under stay-at-home lockdown at the time of data collection. As such, we note our findings lack external validity to a certain degree. As COVID-19 is a worldwide phenomenon, more studies should be conducted to examine whether our observed findings can be replicated across cultures or countries.

Third, there are cultural differences in how people utilize their social support networks. For example, the degree to which people explicitly ask for support from close others varies across cultures (Kim et al., 2008). Therefore, the findings about social support and social liability through social media should be further validated in different cultural contexts.

6. Conclusions

Despite the limitations, this study makes significant contributions by offering a novel theoretical approach to examining the contrasting effects of social media on users' cognitive and affective outcomes. Social media have become a primary mode of information seeking, social support, and entertainment for billions of users worldwide. Numerous studies have examined its effect using various approaches, theories, and concepts. However, as demonstrated in this study, the uses and effects of social media are complicated and involve multiple (and potentially competing) theoretical mechanisms that are yet to be further explicated and investigated. We suggest continued and concerted research efforts that can advance our knowledge about the complex processes underlying the uses and effects of emerging media.

Footnotes

1. While many scholars consider that social media and social networking sites (SNSs) are definitionally equivalent, others have emphasized the need to distinguish between them (see Ledbetter, 2021 for more discussion). In this study, we use these terms interchangeably but highlight that the present study focuses on a subset of social media and functions: the social/relational use of social media (e.g., Facebook, Twitter, Instagram).
2. The average age is slightly higher than that of general Facebook users in the U.S. (40.5 years old) because we excluded users who were younger than 18.
3. Though pre-validated multiple-item scales of loneliness are available (e.g., the UCLA loneliness scale), some items in those scales overlap (e.g., "I lack companionship," "There are people I can turn to") with other constructs (e.g., perceived social support) in our research model. Therefore, we chose a direct, straightforward measure to assess loneliness as a unidimensional emotional outcome ("I feel

lonely") to distinguish it from the exogenous variables in our research model.

Credit author statement

Hichang Cho: Has made a substantial contribution to the design of the study; the collection, analysis, and interpretation of data for the article; drafted the article and revised it. Pengxiang Li: Has contributed to the literature review, data analysis, and paper revision. Annabel Ngien: Has made a substantial contribution to the literature review and paper revision. Marion Grace Tan: Has made a substantial contribution to the literature review. Anfan Chen: Has contributed to the literature review. Elmie Nekmat: Has contributed to the design of the study and data collection.

Conflict of interest

XNo conflict of interest exists.

We wish to confirm that there are no known conflicts of interest associated with this publication and there has been no significant financial support for this work that could have influenced its outcome.

Funding

XNo funding was received for this work.

Intellectual property

XWe confirm that we have given due consideration to the protection of intellectual property associated with this work and that there are no impediments to publication, including the timing of publication, with respect to intellectual property. In so doing we confirm that we have followed the regulations of our institutions concerning intellectual property.

Research Ethics

XWe further confirm that any aspect of the work covered in this manuscript that has involved human patients has been conducted with the ethical approval of all relevant bodies and that such approvals are acknowledged within the manuscript.

XIRB approval was obtained (required for studies and series of 3 or more cases).

Authorship

The International Committee of Medical Journal Editors (ICMJE) recommends that authorship be based on the following four criteria.

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2. Drafting the work or revising it critically for important intellectual content; AND
3. Final approval of the version to be published; AND
4. Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

All those designated as authors should meet all four criteria for authorship, and all who meet the four criteria should be identified as authors. For more information on authorship, please see http://www. icmje. org/recommendations/browse/roles-and-responsibilities/defining-th e-role-of-authors-and-contributors.html#two.

XAll listed authors meet the ICMJE criteria.

We attest that all authors contributed significantly to the creation of this manuscript, each having fulfilled criteria as established by the ICMJE.

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Data availability

Data will be made available on request.

References

Ahmad, A. R., & Murad, H. R. (2020). The impact of social media on panic during the COVID-19 pandemic in Iraqi Kurdistan: Online questionnaire study. *Journal of Medical Internet Research, 22*(5), Article e19556.

Alrasheed, M., Alrasheed, S., & Alqahtani, A. S. (2022). Impact of social media exposure on risk perceptions, mental health outcomes, and preventive behaviors during the COVID-19 pandemic in Saudi Arabia. *Saudi Journal of Health Systems Research, 15*(4), 1–7. https://doi.org/10.1159/000525209

Balzarotti, S., & Ciceri, M. R. (2014). News reports of catastrophes and viewers' fear: Threat appraisal of positively versus negatively framed events. *Media Psychology, 17* (4), 357–377.

Barrera, M. (1986). Distinctions between social support concepts, measures, and models. *American Journal of Community Psychology, 14*(4), 413–445.

Bessière, K., Pressman, S., Kiesler, S., & Kraut, R. (2010). Effects of internet use on health and depression: A longitudinal study. *Journal of Medical Internet Research, 12*(1), e6. https://doi.org/10.2196/jmir.1149

Blau, P. (1964). *Exchange and power in social life*. New York: John Wiley & Sons.

Brailovskaia, J., Miragall, M., Margraf, J., Herrero, R., & Baños, R. M. (2022). The relationship between social media use, anxiety and burden caused by coronavirus (COVID-19) in Spain. *Current Psychology, 41*, 7441–7447. https://doi.org/10.1007/ s12144-021-01802-8

Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. (2020). The psychological impact of quarantine and how to reduce it: Rapid review of the evidence. *The Lancet, 395*(10227), 912–920.

Campbell-Sills, L., Cohan, S. L., & Stein, M. B. (2006). Relationship of resilience to personality, coping, and psychiatric symptoms in young adults. *Behaviour Research and Therapy, 44*(4), 585–599.

Cao, X., & Sun, J. (2018). Exploring the effect of overload on the discontinuous intention of social media users: An SOR perspective. *Computers in Human Behavior, 81*, 10–18.

Carr, C. T., Wohn, D. Y., & Hayes, R. A. (2016). As social support: Relational closeness, automaticity, and interpreting social support from paralinguistic digital affordances in social media. *Computers in Human Behavior, 62*, 385–393.

Cauberghe, V., Van Wesenbeeck, I., De Jans, S., Hudders, L., & Ponnet, K. (2021). How adolescents use social media to cope with feelings of loneliness and anxiety during COVID-19 lockdown. *Cyberpsychology, Behavior, and Social Networking, 24*(4), 250–257.

Cellini, N., Canale, N., Mioni, G., & Costa, S. (2020). Changes in sleep pattern, sense of time and digital media use during COVID-19 lockdown in Italy. *Journal of Sleep Research, 29*(4), Article e13074.

Chen, H. T., & Li, X. (2017). The contribution of mobile social media to social capital and psychological wellbeing: Examining the role of communicative use, friending and self-disclosure. *Computers in Human Behavior, 75*, 958–965.

Choi, S. B., & Lim, M. S. (2016). Effects of social and technology overload on psychological wellbeing in young South Korean adults: The mediatory role of social network service addiction. *Computers in Human Behavior, 61*, 245–254.

Cielo, F., Ulberg, R., & Di Giacomo, D. (2021). Psychological impact of the COVID-19 outbreak on mental health outcomes among youth: A rapid narrative review. *International Journal of Environmental Research and Public Health, 18*(11), 6067.

Cook, K. S., & Rice, E. (2003). Social exchange theory. In J. Delamater (Ed.), *Handbook of social psychology* (pp. 53–76). New York: Kluwer.

Coombs, W. T., & Holladay, S. J. (2005). An exploratory study of stakeholder emotions: Affect and crises. *Research on Emotion in Organizations, 1*, 263–280. -9.

Cordoș, A. A., & Bolboacă, S. D. (2020). Lockdown, social media exposure regarding COVID-19 and the relation with self-assessment depression and anxiety. Is the medical staff different? *International Journal of Clinical Practice*, Article e13933.

Cowan, K. (2020). Survey results: Understanding people's concerns about the mental health impacts of the COVID-19 pandemic. *Academy of Medical Sciences*. Retrieved September 14, 2021, from: https://acmedsci.ac.uk/file-download/99436893.

Dixon, S. (2022). *Social media use during COVID-19 worldwide - statistics & facts. Statistita*. Retrieved September 14, 2022 from: https://www.statista.com/t opics/7863/social-media-use-during-coronavirus-covid-19-worldwide/#t opicHeader_wrapper.

Drouin, M., McDaniel, B. T., Pater, J., & Toscos, T. (2020). How parents and their children used social media and technology at the beginning of the COVID-19 pandemic and associations with anxiety. *Cyberpsychology, Behavior, and Social Networking, 23*(11), 727–736.

Dworkin, E. R., Ullman, S. E., Stappenbeck, C., Brill, C. D., & Kaysen, D. (2018). Proximal relationships between social support and PTSD symptom severity: A daily diary study of sexual assault survivors. *Depression and Anxiety, 35*(1), 43–49.

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.

Folkman, S., Lazarus, R. S., Gruen, R. J., & DeLongis, A. (1986). Appraisal, coping, health status, and psychological symptoms. *Journal of Personality and Social Psychology, 50*(3), 571–579.

Gabbay, S. M., & Leenders, R. T. A. J. (1999). CSC: The structure of advantage and disadvantage. In R. T. A. J. Leenders, & S. M. Gabbay (Eds.), *Corporate social capital and liability* (pp. 1–14). Springer.

Gao, J., Zheng, P., Jia, Y., Chen, H., Mao, Y., Chen, S., … Dai, J. (2020). Mental health problems and social media exposure during COVID-19 outbreak. *PLoS One, 15*(4), Article e0231924.

Gargiulo, M., & Benassi, M. (1999). The dark side of social capital. In R. T. A. J. Leenders, & S. M. Gabbay (Eds.), *Corporate social capital and liability* (pp. 298–322). Springer.

Gloster, A. T., Lamnisos, D., Lubenko, J., Presti, G., Squatrito, V., Constantinou, M., … Karekla, M. (2020). Impact of COVID-19 pandemic on mental health: An international study. *PLoS One, 15*(12), Article e0244809.

Hall, J. A., & Baym, N. K. (2012). Calling and texting (too much): Mobile maintenance expectations, (over) dependence, entrapment, and friendship satisfaction. *New Media & Society, 14*(2), 316–331.

Hansen, M. T., Podolny, J. M., & Pfeffer, J. (2001). Research in the Sociology of organizations. In *So many ties, so little time: A task contingency perspective on corporate social capital in organizations*. Emerald.

Hawkley, L. C., & Cacioppo, J. T. (2010). Loneliness matters: A theoretical and empirical review of consequences and mechanisms. *Annals of Behavioral Medicine, 40*(2), 218–227.

de Hoog, N., & Verboon, P. (2020). Is the news making us unhappy? The influence of daily news exposure on emotional states. *British Journal of Psychology, 111*(2), 157–173.

Kazdin, A. E. (2007). Mediators and mechanisms of change in Psychotherapy research. Annual. *Review of Clinical Psychology, 3*(1), 1–27. https://doi.org/10.1146/annurev. clinpsy.3.022806.091432

Khodabakhsh, S., & Ahmadi, S. (2021). The relationship between subjective happiness and social media usage during the COVID-19 pandemic: The moderating role of resilience. *Aloma, 38*(2), 105–112. https://doi.org/10.51698/aloma.2020.38.2.105-112

Kim, H. S., Sherman, D. K., & Taylor, S. E. (2008). Culture and social support. *American Psychologist, 63*(6), 518–526. https://doi.org/10.1037/0003-066X

Kroenke, C. H., Kubzansky, L. D., Schernhammer, E. S., Holmes, M. D., & Kawachi, I. (2006). Social networks, social support, and survival after breast cancer diagnosis. *Journal of Clinical Oncology, 133*(1), 375–385.

Kvaal, K., Halding, A. G., & Kvigne, K. (2013). Social provision and loneliness among older people suffering from chronic physical illness. A mixed-methods approach. Scandinavian. *Journal of Caring Sciences, 28*(1), 104–111.

Lazarus, R. S. (1991). *Emotion and adaptation*. Oxford University Press.

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping* (1st ed.). New York, USA: Springer Publishing Company.

Ledbetter, A. M. (2021). An introduction to the special issue on social media, or why this isn't a special issue on social network(ing) sites. *Communication Monographs, 88*(1), 1–4.

Lee, J., & Jang, S. (2022). Have changes in internet use during the COVID-19 pandemic affected older adults' self-rated health? A cross-sectional study of young-old and old-old populations in Korea. *Geriatric Nursing*. https://doi.org/10.1016/j. gerinurse.2022.09.012

Lee, Y., Jeon, Y. J., Kang, S., Shin, J. I., Jung, Y.-C., & Jung, S. J. (2022). Social media use and mental health during the COVID-19 pandemic in young adults: A meta-analysis of 14 cross-sectional studies. *BMC Public Health, 22*(1). https://doi.org/10.1186/s12889-022-13409-0

Lerner, J. S., Li, Y., Valdesolo, P., & Kassam, K. S. (2013). Emotion and decision-making. *Annual Review of Psychology, 66*, 799–823.

Lisitsa, E., Benjamin, K. S., Chun, S. K., Skalisky, J., Hammond, L. E., & Mezulis, A. H. (2020). Loneliness among young adults during Covid-19 pandemic: The mediational roles of social media use and social support seeking. *Journal of Social and Clinical Psychology, 39*(8), 708–726.

Luchetti, M., Lee, J. H., Aschwanden, D., Sesker, A., Strickhouser, J. E., Terracciano, A., & Sutin, A. R. (2020). The trajectory of loneliness in response to COVID-19. *American Psychologist, 75*(7), 897–908.

Lup, K., Trub, L., & Rosenthal, L. (2015). Instagram #Instasad?: Exploring associations among Instagram use, depressive symptoms, negative social comparison, and

strangers followed. *Cyberpsychology, Behavior, and Social Networking, 18*(5), 247–252.

Maier, C., Laumer, S., Eckhardt, A., & Weitzel, T. (2015). Giving too much social support: Social overload on social networking sites. *European Journal of Information Systems, 24*(5), 447–464.

Major, B., Cozzarelli, C., Sciacchitano, A. M., Cooper, M. L., Testa, M., & Mueller, P. M. (1990). Perceived social support, self-efficacy, and adjustment to abortion. *Journal of Personality and Social Psychology, 59*(3), 452–463.

Marciano, L., Ostroumova, M., Schulz Peter, J., & Camerini, A.-L. (2022). Digital media use and adolescents' mental health during the covid-19 pandemic: A systematic review and meta-analysis. *Frontiers in Public Health, 9*, Article 793868. https://doi. org/10.3389/fpubh.2021.793868

Marino, C., Gini, G., Vieno, A., & Spada, M. M. (2018). The associations between problematic Facebook use, psychological distress and wellbeing among adolescents and young adults: A systematic review and meta-analysis. *Journal of Affective Disorders, 226*, 274–281.

Merton, R. K. (1986). *Social theory and social structure*. The Free Press.

Muscanell, N. L., & Guadagno, R. E. (2012). Make new friends or keep the old: Gender and personality differences in social networking use. *Computers in Human Behavior, 28*(1), 107–112.

Ngien, A., & Jiang, S. (2021). The effect of social media on stress among young adults during COVID-19 Pandemic: Taking into account fatalism and social media exhaustion. *Health Communication, 1–8*. https://doi.org/10.1080/10410236.2021.1888438

Orben, A., & Przybylski, A. K. (2019). The association between adolescent well-being and digital technology use. *Nature Human Behaviour, 3*(2), 173–182. https://doi.org/10.1038/s41562-018-0506-1

Pang, H. (2018). Exploring the beneficial effects of social networking site use on Chinese students' perceptions of social capital and psychological wellbeing in Germany. *International Journal of Intercultural Relations, 67*, 1–11.

Peacock, E. J., & Wong, P. T. P. (1990). The stress appraisal measure (SAM): A multidimensional approach to cognitive appraisal. *Stress Medicine, 6*(3), 227–236.

Pennington, N. (2021). Communication outside of the home through social media during COVID-19. *Computers in Human Behavior Reports, 4*, Article 100118.

Pillai, K. G., Hodgkinson, G. P., Kalyanaram, G., & Nair, S. R. (2017). The negative effects of social capital in organizations: A review and extension. *International Journal of Management Reviews, 19*(1), 97–124.

Portes, A. (1998). Social capital: Its origins and applications in modern sociology. *Annual Review of Sociology, 24*, 1–24.

Rodriguez, M., Bellet, B. W., & McNally, R. J. (2020). Reframing time spent alone: Reappraisal buffers the emotional effects of isolation. *Cognitive Therapy and Research, 44*, 1052–1067.

Saud, M., Mashud, M., & Ida, R. (2020). Usage of social media during the pandemic: Seeking support and awareness about covid-19 through social media platforms. *Journal of Public Affairs, 20*(4), e2417.

Scharkow, M. (2016). The accuracy of self-reported internet use—a validation study using client log data. *Communication Methods and Measures, 10*(1), 13–27.

Scherer, K. R. (2001). Appraisal considered as a process of multilevel sequential checking. In K. R. Scherer, A. Schorr, & T. Johnstone (Eds.), *Appraisal processes in emotion: Theory, methods, research* (pp. 92–120). Oxford University Press.

Sedikides, C., Wildschut, T., Routledge, C., & Arndt, J. (2015). Nostalgia counteracts self-discontinuity and restores self-continuity. *European Journal of Social Psychology, 45*(1), 52–61.

Shannon, M., & Lee, K. A. (2008). HIV-infected mothers' perceptions of uncertainty, stress, depression and social support during HIV viral testing of their infants. *Archives of Women's Mental Health, 11*(4), 259–267.

Sharma, M. K., John, N., & Sahu, M. (2020). Influence of social media on mental health. *Current Opinion in Psychiatry, 33*(5). https://doi.org/10.1097/yco.0000000000000631

Street, R. L. (2003). Mediated consumer–provider communication in cancer care: The empowering potential of new technologies. *Patient Education and Counseling, 50*(1), 99–104. https://doi.org/10.1016/s0738-3991(03)00089-2

Surma, J. (2016). Social exchange in online social networks. The reciprocity phenomenon on Facebook. *Computer Communications, 73*, 342–346.

Tak, Y. R., & McCubbin, M. (2002). Family stress, perceived social support and coping following the diagnosis of a child's congenital heart disease. *Journal of Advanced Nursing, 39*(2), 190–198.

Taylor, S. H., & Bazarova, N. N. (2018). Social media and subjective wellbeing: A relational perspective. *In A networked self and love*, 86–112 (Routledge).

Tull, M. T., Edmonds, K. A., Scamaldo, K. M., Richmond, J. R., Rose, J. P., & Gratz, K. L. (2020). Psychological outcomes associated with stay-at-home orders and the perceived impact of COVID-19 on daily life. *Psychiatry Research, 289*, Article 113098.

Valdez, D., Ten Thij, M., Bathina, K., Rutter, L. A., & Bollen, J. (2020). Social media insights into US mental health during the COVID-19 pandemic: Longitudinal analysis of Twitter data. *Journal of Medical Internet Research, 22*(12), Article e21418.

Verbeij, T., Pouwels, J. L., Beyens, I., & Valkenburg, P. M. (2021). The accuracy and validity of self-reported social media use measures among adolescents. *Computers in Human Behavior Reports, 3*, Article 100090.

Victor, C., Grenade, L., & Boldy, D. (2005). Measuring loneliness in later life: A comparison of differing measures. *Reviews in Clinical Gerontology, 15*(1), 63.

Weiss, R. (1973). *Loneliness: The experience of emotional and social isolation (MIT press)* (New edition). Cambridge, USA: The MIT Press.

Weiss, R. (1974). The provision of social relationships. In Z. Rubin (Ed.), *Doing unto others* (pp. 17–26) (NJ, USA: Englewood Cliffs).

Wright, K. B. (1999). Computer-mediated support groups: An examination of relationships among social support, perceived stress, and coping strategies. *Communication Quarterly, 47*(4), 402–414.

Yang, C. C., Tsai, J. Y., & Pan, S. (2020). Discrimination and well-being among Asians/Asian Americans during COVID-19: The role of social media. *Cyberpsychology, Behavior, and Social Networking, 23*(12), 865–870.

Zhang, X., Ding, X., & Ma, L. (2020). The influences of information overload and social overload on intention to switch in social media. *Behaviour & Information Technology,* 1–14.