

Juan Liu* and Jung-Sook Lee

Social media influencers and followers' loneliness: the mediating roles of parasocial relationship, sense of belonging, and social support

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Abstract

Purpose: Prior research examines how social media use in general affects experiences of loneliness, but few studies have investigated the specific effects of interaction with social media influencers on loneliness and well-being. The study investigates how followers' interaction with social media influencers affects loneliness through mediation mechanisms underlying this process.

Design/methodology/approach: An online survey was adopted using Qualtrics, and participants were U.S. residents recruited through Dynata, a professional sampling corporation.

Findings: Results suggested that interaction with influencers was positively associated with loneliness through parasocial relationships and perceived social support. In addition, a sense of belonging and perceived social support significantly mediate the relationship between interaction with influencers and loneliness.

Practical implications: Our study suggests that while interactions with SMIs may foster parasocial relationships, a sense of belonging, and social support, they can paradoxically also increase feelings of loneliness. This indicates that SMIs can act as a double-edged sword, namely providing social bonds but simultaneously amplifying loneliness. Thus, it is critical for followers to be aware of their emotional attachment to SMIs and the potential adverse effects on their well-being.

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***Corresponding author: Juan Liu**, Department of Mass Communication, Towson University, 8000 York Rd., Towson, MD 21252, USA, E-mail: juanliu@towson.edu. <https://orcid.org/0000-0002-3616-2242>

Jung-Sook Lee, Department of Mass Communication, Towson University, 8000 York Rd., Towson, MD 21252, USA, E-mail: jslee@towson.edu

Social implications: Our study has important implications for how we conceptualize the role of social media influencers in the modern information environment. The study provides empirical support and is a starting point for future research on SMIs' impacts on emotional, social, and psychological well-being. Findings from the study contribute to the scholarly works investigating the adverse effects of following and interacting with SMIs.

Originality/value: Our finding differs from previous research suggesting active social media use helps reduce loneliness through enhanced social support. Such contradictions may be attributed to the nature of interacting with SMIs, which affects loneliness through serial mediators. The study contributes to the scholarly works investigating the adverse effects of following and interacting with SMIs.

Keywords: social media influencers; loneliness; parasocial relationships; sense of belonging; perceived social support; United States

1 Introduction

While digital technology innovations have made the world more connected, more people feel lonely than before (Ernst et al. 2022). Loneliness reflects “the difference between a person’s actual and desired level of connection,” and this means “even a person with a lot of friends can feel lonely” (Centers for Disease Control and Prevention 2024). Loneliness is a widespread problem in the U.S., and more than 1 in 3 adults feel lonely in the United States (National Academies of Sciences, Engineering, and Medicine 2020), posing a serious threat to their mental and physical health. For instance, research has associated loneliness with higher risks for a variety of physical and mental conditions including high blood pressure, heart disease, obesity, a weakened immune system, anxiety, depression, cognitive decline, Alzheimer’s disease, and even death (Shankar et al. 2013). Loneliness not only has become a growing public health issue, but also increases health expenditure, particularly among younger age groups (Meisters et al. 2021).

Extensive research has examined the relationships between social media use and loneliness (O’Day and Heimberg 2021; Pittman and Reich 2016; Wang et al. 2018), and findings have been inconsistent. While a few studies demonstrated that active social media use was linked to lower levels of loneliness (Lin et al. 2022; Thomas et al. 2020), more research has suggested that social media use is associated with greater loneliness (LaRose et al. 2010; Primack et al. 2017; Song et al. 2014). Social media platforms continue to expand, and users interact with diverse groups of people on social media (e.g., friends, family, celebrities, influencers, etc.). Although most research examines how social media use in general affects experiences of loneliness,

few studies have investigated the specific effects of interaction with social media influencers on loneliness and well-being. The proliferation of social media has facilitated the emergence of social media content creators who actively distribute information and opinions. Some content creators achieve the status of social media influencers by becoming a source of information and influence for a large number of followers (Enke and Borchers 2019).

Drawing upon the evolutionary theory of loneliness (Cacioppo and Hawkley 2009; Cacioppo et al. 2006) and literature on parasocial relationships (Horton and Wohl 1956), sense of belonging (Hagerty et al. 1992), and social support (Willis 1991), the study investigates how followers' interaction with social media influencers affects loneliness through mediation mechanisms underlying this process.

1.1 Evolutionary theory of loneliness and media use

Weiss (1975) defines loneliness as perceived social isolation, a state described as an edged, persistent disease without redeeming features. Perlman and Peplau (1981) conceptualize loneliness as “the unpleasant experience that occurs when a person's network of social relations is deficient in some important way, either quantitatively or qualitatively” (p. 31). In other words, loneliness is an aversive and subjective state where individuals are discontented with their social relationships (Geukens et al. 2022).

The Evolutionary theory of loneliness (ETL) formulated by Cacioppo provides a theoretical explanation for the perception of loneliness (Cacioppo and Cacioppo 2018). Considering that need to belong is a fundamental human need (Baumeister and Leary 1995), the theory posits that feelings of loneliness occur and remain over time, and that loneliness can influence physiological and mental health. According to the ETL (Cacioppo et al. 2014), loneliness or social isolation acts as a signaling function similar to physical pain. Although loneliness is in itself a negative experience, ETL assumes loneliness triggers the motive of re-affiliation in order to obtain and provide protection against a possible threat (Cacioppo and Cacioppo 2018). In other words, loneliness urges people to reconnect with significant others, and consequently, reduce their feelings of loneliness (Geukens et al. 2022; Perlman and Peplau 1981; Weiss 1975). However, if that motive for social connection cannot be satisfied, people may subsequently experience loneliness (Cacioppo and Hawkley 2009).

The relationship between social connection and social isolation is complex. While both are important in people's physical and mental well-being, seeking social connectedness and avoiding social isolation are considered two distinctive dimensions of social relatedness (Ahn and Shin 2013). From the evolutionary psychology perspective, seeking social connectedness represents an approach behavior for a positive outcome, while avoiding social isolation represents an avoidance

behavior of a negative outcome for survival (Tooby and Cosmides 2005). However, the two dimensions of relatedness are differentially affected by different modes of communication. For instance, Ahn and Shin (2013) showed that face-to-face communication contributed to people's subjective well-being by facilitating both an avoidance of social isolation and a pursuit of social connectedness. In contrast, media-mediated communication facilitated social connectedness only, but not avoidance of social isolation.

Sheldon et al. (2011) argue that the sense of disconnection functions as a drive to an increase in people's media use as a coping strategy, and these individuals are rewarded with a sense of connectedness with others. However, people's sense of connectedness in a mediated world does not necessarily lead to a relief from the feeling of social isolation in their real world. It is well documented that in-person interaction is a protective factor against loneliness (MacDonald et al. 2021), while media-mediated communication may not offset loneliness from the lack of in-person interaction (Twenge et al. 2019). Reducing social isolation is strongly associated with non-verbal emotional support and physical contact (e.g., hugs) that are unique to face-to-face communication (Ahn and Shin 2013; Tejada et al. 2020). The lack of such a strong bonding mechanism in media-mediated communication may explain why lonely individuals who are motivated to use media to fill the void from social isolation still feel lonely in the real world despite their social connectedness in the media-mediated world (Kim et al. 2009; Twenge et al. 2019).

From the perspective of ETL, loneliness is considered as a biological signal that motivates individuals to seek social connection. In today's world, people may consider social media as a convenient platform that substitutes for face-to-face connections to maintain social ties, especially when physical proximity to others is limited due to factors like geographical dispersal (Cacioppo and Cacioppo 2018). Interactions with social media influencers represent a type of such connection. While ETL draws a link between loneliness and general wellbeing, namely the feeling of loneliness may lead to diminished well-being, it remains unclear whether seeking social connection such as interaction with social media influencers may diminish or strengthen one's feeling of loneliness. Thus, the purpose of the study is to bridge this gap by investigating how such media-mediated connection influences loneliness. This is an important gap to bridge, because doing so would increase our understanding of the unexplored impact of influencers, extending ETL in the context of social media influencers.

1.2 Social media use and loneliness

Social media may act as a source of social connection and inclusion and may, in turn, prevent loneliness or provide alleviation from loneliness (Nowland et al. 2018;

Pittman and Reich 2016; Thomas et al. 2020). Additionally, social media may work as a substitute for real-life social relationships. Phu and Gow (2019) suggest that a higher number of Facebook friends was associated with lower levels of loneliness. Similarly, Lin et al. (2022) found that social networking sites provide people with a platform to interact and connect with others, which lessens feelings of loneliness. Pittman and Reich (2016) suggested that, compared with text-based social media use (e.g., Twitter), image-based social media use (e.g., Instagram, Snapchat) attenuates users' loneliness due to enhanced intimacy.

On the other hand, loneliness has been exacerbated during the pandemic, and scholars have found that more frequent social media use and poorer mental health outcomes have been relatively consistent throughout the pandemic (Bonsaksen et al. 2023). Several studies show that using social media increases loneliness. For instance, scholars suggested that Facebook use was positively associated with loneliness (Song et al. 2014). Marttila et al. (2021) found that increased problematic social media use predicted enhanced loneliness. Primack et al. (2017) found that young adults with high social media use felt more socially isolated than those with lower social media use. Two large-scale longitudinal surveys of U.S. adolescents ($N = 8.2$ million) over decades showed that those low on in-person social interactions but high on social media usage reported the most loneliness (Twenge et al. 2019).

Some scholars find a complicated relationship between social media use and loneliness (Wang et al. 2018; Yang 2016). For instance, Wang et al. (2018) identified a U-shaped relationship between active social media use and loneliness. Yang (2016) showed that Instagram interaction and browsing were associated with lower loneliness, whereas Instagram broadcasting was related to higher loneliness. Fumagalli et al. (2022) suggest that social media may increase the quantity of social contacts and interactions, but the quality of contacts and interactions may decrease. Such replacement of high-quality in-person interactions with lower-quality social media interactions may increase loneliness. The advent of various social media platforms affording social interaction makes relationships more complex.

Although some studies have suggested that social media use may promote psychological wellbeing like decreasing loneliness (Pittman and Reich 2016), more research has indicated that it is associated with greater loneliness (Song et al. 2014). For instance, Song et al. (2014) conducted a meta-analysis to explore the relationship between Facebook use and loneliness. Results indicated Facebook use was positively associated with loneliness (Song et al. 2014). In a recent systematic review, O'Day and Heimberg (2021) examined loneliness in the context of social media use and found that lonely individuals use social media problematically, defined in terms of greater frequency, greater intensity, and more addictively. They also called on more research needed to elucidate potential bidirectional relationships between loneliness and social media use. Through a systemic review and meta-analysis, Marciano

et al. (2022) explored the link between mental health and digital media use in adolescents during COVID-19 and found digital media use was related to higher ill-being. Nevertheless, not all types of digital media use have a negative consequence. One-to-one communication, mutual online friendship, and positive and funny online experiences mitigated feelings of loneliness (Marciano et al. 2022). To date, there has been a large amount of scholarship investigating the relationship between general social media use and loneliness. However, there is limited research examining how communication with SMIs, in particular, affects loneliness.

1.3 Social media influencers and loneliness

The rise of social media has made it easier for people to build an extensive network of followers and voice their opinions about various issues (Schmuck et al. 2022). Social media influencers (SMIs) are ordinary people who gain popularity and fame by regularly producing and uploading original content on social media and by self-branding their expertise in specific categories (Lou and Yuan 2019). They “represent a new type of independent third-party endorser who shapes audience attitudes through blogs, tweets, and the use of other social media” (Freberg et al. 2011 p. 90). SMIs can be considered digital opinion leaders (De Veirman et al. 2017) who increasingly promote branded products (Sokolova and Kefi 2020) based on authentic relationships with their followers (Jin 2018). The original content often goes viral and allows SMIs to obtain high visibility, which, in turn, increases their number of followers and their influence (Garcia 2017). Some influencers’ expertise often originated from their professional careers in specific niches. For instance, many mental health influencers are therapists, life coaches, or mental health experts who utilize social media to grow their professional outreach and raise awareness about mental health by engaging with online audiences (Triplett et al. 2022). Koh and Liew (2022) examined the expression of loneliness on Twitter during the COVID-19 pandemic and found that highly influential users were more likely to talk about mental health issues related to loneliness.

As a noticeable and relatively new online activity, interaction with influencers warrants scholarly attention and research. While research into SMIs’ impact on mental health is still in its infancy, early evidence indicates mixed results. Chae (2018) reported that young women who frequently interacted with SMIs were more likely to compare their lives to those influencers, which, in turn, increased their envy toward the influencer. Farivar et al. (2022) demonstrated that the length of following SMIs enhanced the users’ parasocial relationship with those SMIs, which, in turn, increased their problematic behavior with the SMIs. By contrast, Pilgrim and Bohnet-Joschko (2019) indicate that upward comparison with SMIs enhances self-

improvement motivation, positively influencing individuals' lives, fashion, and health. Involving SMI-related activities such as visiting SMIs' profile pages and purchasing from SMI accounts are positively associated with a consumer's happiness (Lee et al. 2021).

A recent systematic review examining the impact of SMIs on health outcomes showed that most studies about SMIs focus on body image (Powell and Pring 2024). Specifically, exposure to idealized influencer body imagery had significant negative impacts on body image and mood (McComb and Mills 2021). The systematic review found that there is only one study that looked at anxiety as the outcome (Powell and Pring 2024) and individuals reported greater levels of anxiety and envy after exposure to portrayals of motherhood posted by influencers (Kirkpatrick and Lee 2022). Powell and Pring (2024) contended that SMIs have both negative and positive impacts on health outcomes, with negative impacts revealed consistently in research of body image dissatisfaction.

Although limited research exists on the impact of SMIs on followers' loneliness, an earlier review of literature on the ETL demonstrates that people's relationships in the media-mediated world fail to alleviate their feelings of loneliness in the real world, and most empirical evidence indicates that SMIs tend to have a negative influence on health outcomes (Powell and Pring 2024). Therefore, we anticipate:

H1: Interaction with SMIs is positively related to loneliness.

1.4 SMIs, parasocial relationships, and loneliness

A parasocial relationship is defined as a relational phenomenon in which audience members develop a special social attachment with a media personality based upon the illusion of a direct, face-to-face social interaction taking place during the personality's performance (Horton and Wohl 1956). Such hallucinatory closeness can be subconsciously deceptive to audience members, leading them to form an impression that they and the media personality share an intimate connection that occurs. The interactive nature of social networking sites and how many platforms, such as TikTok and Instagram, encourage content creators and followers to engage with one another are considered primary factors in promoting parasocial interactions and the cultivation of parasocial relationships (Cheung et al. 2022; Kim et al. 2019; Triplett et al. 2022).

As for SMIs, the forging of parasocial relationships that are perceived to be authentic and intimate plays an essential role in achieving growth and maintaining large numbers of followers (Uzunoglu and Kip 2014; Yuan and Lou 2020). Interacting with SMIs enables the development of parasocial relationships through gifting or enhanced product interest among followers (Lou 2022; Yuan and Lou 2020). Many

influencers actively reply to followers' comments or questions and schedule offline meetups or live-streaming sessions to promote more interactive connections (Abidin 2015). SMIs often purposely reveal personal stories or anecdotes to exemplify authenticity (Dhanesh and Duthler 2019), and they also reciprocate their followers with free endorsed products and other types of support (Lou 2022).

Parasocial relationships have been found to mediate the relationship between social media interactions and source trustworthiness (Chung and Cho 2017). Specially, social media interaction with celebrities leads to stronger parasocial relationships, which leads to higher levels of source trustworthiness, which in turn, has a positive influence on brand credibility (Chung and Cho 2017). Stein et al. (2024) uncovered evidence that mentally activating parasocial relationships with a media character did not lead to a significant reduction of loneliness. Farivar et al. (2022) found influencer characteristics can foster followers' problematic engagement through the mediation of parasocial relationships. de Bérail et al. (2019) found that parasocial relationships act as a mediator between social anxiety and YouTube addiction. Because parasocial relationships between the audience and performers lack reciprocity and authenticity, past research showed that parasocial relationships with celebrities whose lives are very distant from ordinary people may result in life dissatisfaction, frustration, alienation, or loneliness (Ashe and McCutcheon 2001; Hoffner 1996; Horton and Wohl 1956). For instance, Baek et al. (2013) found that dependency on parasocial relationships is positively related to loneliness. Thus, we expect that:

H2: Parasocial relationships will mediate the positive relationship between interaction with SMIs and loneliness, such that interactions with SMIs will be positively related to parasocial relationships and parasocial relationships will be positively related to loneliness.

1.5 SMIs, sense of belonging, and loneliness

Social psychology identifies two types of attachments within groups or communities: bond-based and identity-based attachments (Prentice et al. 1994). Bond-based attachment involves relationships formed between individuals within the group (Festinger et al. 1950), while identity-based attachment reflects the connection a person feels with the group as a whole through shared social identity (Hogg and Turner 1985; Tajfel and Turner 2003). Although identity-based and bond-based attachments are distinct, they frequently occur together within individuals connected to a particular community. Members can simultaneously feel a sense of belonging to the community as a whole and form individual connections with others within the group (Ren et al. 2012). Communities typically seek to cultivate both types of attachment to strengthen engagement and connection among their members.

Attachment theory explains how people establish an identity-based connection with others in a group (Hogg and Turner 1985). In attachment theory, the identity-based attachment to a group is distinguished from a bond-based attachment to an individual (Festinger et al. 1950). The distinction is used to compare two different types of relationships between SMIs and followers. While bond-based attachment forms the basis of parasocial relationships between the SMIs and the follower, identity-based attachment forms the basis of a sense of belonging that followers share with the influencer's community as a whole (Farivar et al. 2022). One factor that attracts people to SMIs is the stickiness of an influencer, which is also called a sense of belonging (Farivar et al. 2022; Zhao et al. 2012). Sense of belonging refers to “the experience of personal involvement in a system or environment so that persons feel themselves to be an integral part of that system or environment” (Hagerty et al. 1992, p. 173). Because the sense of belonging is an essential human need that has evolutionary roots in self-preservation (Maslow 1954), it is associated with one's mental health and social well-being (Hagerty et al. 1992). Individuals need to establish “regular social contact with those to whom they feel connected” (Baumeister and Leary 1995, p. 501).

Prior research used both types of attachment to explain and understand social behavior (de Bérail et al. 2019; Farivar et al. 2022). In the context of social media, de Bérail et al. (2019) found that parasocial relationships, a bond-based attachment, is linked with addiction to YouTube. Farivar et al. (2022) have found the mediating roles of bond-and identity-based attachment (i.e. parasocial relationship and sense of belonging) on problematic engagement with SMIs. Consistent exposure to influencers' curated lives may lead followers to compare their own lives unfavorable, contributing to feelings of inadequacy and loneliness (Dussen 2021). From the perspective of ETL, even though SMIs provide one-sided emotional connections through communication, these interactions are mediated communication and lack real-world reciprocity, namely failing to replace the depth of real-world interactions, thus reinforcing a cycle of loneliness (Kim et al. 2009; Twenge et al. 2019). The study aims to apply and compare the two types of attachment in explaining the impact of SMIs on loneliness. Therefore, aligned with H2, we anticipate:

H3: Sense of belonging mediates the positive relationship between interaction with SMIs and loneliness, such that interactions with SMIs will be positively related to sense of belonging and sense of belonging will be positively related to loneliness.

1.6 Perceived social support

Followers often perceive influencers as attractive, authentic, and similar to them (Schouten et al. 2020; Tafesse and Wood 2021). The positive view of influencers among followers makes the influencers' messages highly effective (Lou and Yuan 2019;

Tafesse and Wood 2021). For instance, Lou and Kim (2019) found that parasocial relationships mediate influencer credibility and content value. Therefore, we contend that when a follower develops a parasocial relationship with an influencer, the follower will derive some significant benefit or social support from the influencer's social media presence or social interaction.

Scholars paid considerable attention to social support and loneliness (Caba Machado et al. 2022; Lee et al. 2021; Perlman and Peplau 1981). Social support is defined as “information leading the subject to believe that he is cared for and loved, esteemed, and a member of a network of mutual obligations” (Cobb 1976, p. 300), which exerts a significant influence on individuals' well-being (Deters and Mehl 2013). One motive for using social media is to achieve and maintain social support (Lou 2022). The rise of social media has altered the dynamics of social interaction, influencing social support and loneliness in various manners (Caba Machado et al. 2022; Lin et al. 2022).

Prior studies reveal that social support mediates the relationship between active social media use and loneliness (Lin et al. 2022). Specifically, individuals who tend to use SNS actively are more likely to have a higher level of perceived social support, which is associated with a lower level of loneliness (Lin et al. 2022). Lo (2019) suggests that despite that social support mediates the relationship between social overload and social networking site exhaustion, for lonely social media users, receiving social support does not help improve satisfaction. Furthermore, perceived social support mediates the relationship between attachment and loneliness (Benoit and DiTommaso 2020). Specifically, Benoit and DiTommaso (2020) found that greater attachment insecurity predicted lower levels of online perceived social support, which subsequently is associated with greater levels of loneliness. Therefore, we propose,

H4: Interaction with SMIs will be indirectly related with loneliness via parasocial relationships and perceived social support, and such that the path from interactions with SMIs to parasocial relationships to perceived social support to loneliness is positive.

H5: Interaction with SMIs will be indirectly related with loneliness via sense of belonging and perceived social support, and such that the path from interactions with SMIs to sense of belonging to perceived social support to loneliness is positive.

Figure 1 proposes the conceptual model.

2 Methods

To test the proposed hypotheses, an online survey was created using Qualtrics, and participants were recruited through a professional sampling corporation, Dynata, in late October 2022. Two screening questions were designed at the beginning of the

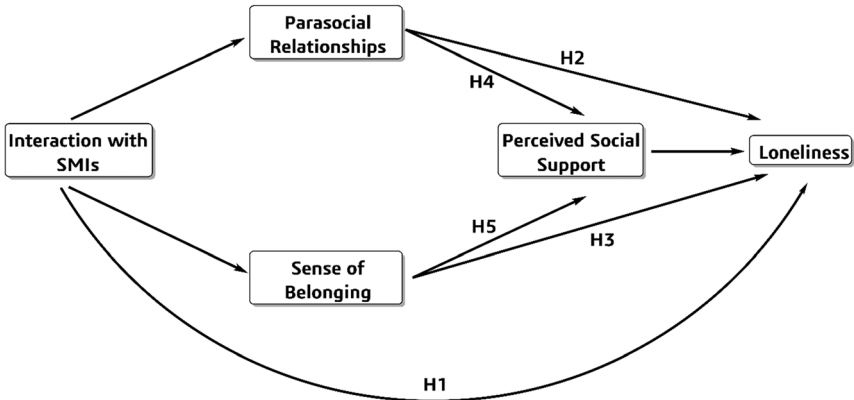


Figure 1: Proposed conceptual model.

survey to ensure that participants have interacted with SMIs in the past 30 days and were able to name one influencer they interacted with (e.g., viewed influencer’s posts, pictures, and videos, or liked, shared or commented on influencer’s posts) most often. Participants were then asked to answer questions about the interaction attributes with that influencer (e.g., frequency and amount of time), parasocial relationships with that influencer, sense of belonging, social support, and loneliness. Before debriefing, participants answered demographic questions.

2.1 Sample

A priori power analysis was conducted using G*Power to determine the sample size. The α value was set to 0.05 and power to 0.95. The effect size f was set to 0.15. The results showed that the required sample size with four covariates was 138. Accordingly, a total of 430 participants were recruited for this study. The resulting sample had an average age of 46.6, was 58.4 % female, and was 41.2 % college educated. Racially, the sample was 77.9 % who identified as Caucasian, 13 % as African American, 3.7 % as Asian, 0.9 % as Native American, and 4.4 % as multiple races or another race.

2.2 Measures

Table 1 presents the specific measurement items for key constructs.

Table 1: Mean, standard deviation, and reliability of measured variables.

Variable	<i>M</i>	<i>SD</i>	α
Interaction with SMIs	3.10	1.39	0.81
The frequently that I interact with (e.g., viewed, commented on, liked, or shared the content) the content posted by the SMI in a week.	3.08	1.50	
The amount of time that I spend on (e.g., viewed, commented on, liked, or shared the content) the content posted by the SMI in a week.	3.12	1.54	
Parasocial relationships	5.21	1.26	0.91
The influencer makes me feel comfortable, as if I am with a friend.	5.20	1.44	
I see the influencer as a natural, down-to-earth person.	5.44	1.38	
If the influencer starts another social media channel, I will also follow.	5.20	1.46	
I would like to meet the influencer in person.	5.07	1.62	
The influencer is the kind of person I would like to play or hang out with.	5.17	1.49	
Sense of belonging	5.09	1.20	0.90
I feel a strong sense of belonging to this influencer's content.	5.06	1.43	
I have complete trust of others in this influencer's account.	4.85	1.50	
I enjoy being a follower of this influencer.	5.33	1.37	
I am very committed to this influencer.	4.90	1.46	
Overall, this influencer account has a high level of morale.			
Perceived social support	4.88	1.23	0.86
Interacting with the influencer helps me take care about my well-being.	4.92	1.41	
I get a lot of social support from the influencer's content.	4.73	1.49	
I am having fun from interacting with the influencer.	5.18	1.39	
The influence's content helps me deal with a lot of my problems in life.	4.68	1.55	
Loneliness	3.59	1.77	0.91
I feel a lack of companionship.	3.68	1.98	
I feel left out.	3.52	1.87	
I feel isolated from others.	3.57	1.93	

Interaction with the SMI was measured using two questions on a 7-point scale. One sample item asks participants “how frequently they interacted with the content posted by the influencer” (Cronbach’s $\alpha = 0.81$, $M = 3.10$, $SD = 1.39$).

Parasocial relationship with the influencer was adapted from prior literature (Rubin and McHugh 1987; Sokolova and Kefi 2020) and measured by a five-item 7-point Likert scale. One example item is “the influencer makes me feel comfortable as if I am with a friend” (Cronbach’s $\alpha = 0.90$, $M = 5.21$, $SD = 1.26$).

Sense of belonging was measured using a five-item 7-point Likert scale adapted from Farivar et al. (2022) and Zhao et al. (2012). One example item is “I feel a strong sense of belonging to this influencer” (Cronbach’s $\alpha = 0.90$, $M = 5.09$, $SD = 1.20$).

Perceived social support was adapted from Lin et al. (2022) and Lo (2019) and measured using a four-item 7-point Likert scale. One example item is “I get a lot of social support from this influencer” (Cronbach’s $\alpha = 0.86$, $M = 4.88$, $SD = 1.23$).

Table 2: Correlation matrix for key constructs.

	Interaction with SMIs	Parasocial relationships	Sense of belonging	Perceived social support	Loneliness
Interaction with SMIs	1				
Parasocial relationships	0.26**	1			
Sense of belonging	0.29**	0.83**	1		
Perceived social support	0.26**	0.71**	0.76**	1	
Loneliness	0.09	0.22**	0.24**	0.26**	1

Note: **Correlation is significant at $p < 0.01$ (2-tailed).

Loneliness was measured using the three-item 7-point Likert scale adapted from Hughes et al. (2004). Participants were asked to what extent they felt “a lack of companionship, left out, and isolated from others” (Cronbach’s $\alpha = 0.91$, $M = 3.59$, $SD = 1.77$).

The correlations for key constructs are shown in Table 2.

3 Results

We tested our hypotheses using Hayes’ (2013) PROCESS macro, Model 80, with 5,000 bias-corrected bootstrap samples and 95 % confidence intervals (CIs). Statistical significance ($p < 0.05$) is achieved when lower bound (LL) and upper bound (UL) CI do not include zero. Demographic information such as gender, age, education, and race were all included in the analysis as control variables. Only age showed significant effects on loneliness. Age had a negative relationship with loneliness; younger people were more likely to experience loneliness.

H1 proposed that interaction with SMIs would be positively associated with loneliness. After controlling for demographic information, results suggested a nonsignificant relationship ($b = -0.04$, $SE = 0.03$, $p = 0.25$). H1 was not supported. In addition, results showed a nonsignificant direct effect of interaction with SMIs on perceived social support ($b = 0.02$, $SE = 0.03$, $p = 0.56$).

H2 anticipated that parasocial relationships mediate the association between interaction with SMIs and loneliness. Significant results were found for the mediating effect of parasocial relationships $b = 0.08$, $SE = 0.03$, 95 % CI [0.0372, 0.1389], providing support for H2. Specifically, interaction with SMIs was positively related to parasocial relationships with the influencer, $b = 0.19$, $SE = 0.04$, $p < 0.001$. The parasocial relationship was positively associated with loneliness, $b = 0.44$, $SE = 0.06$, $p < 0.001$.

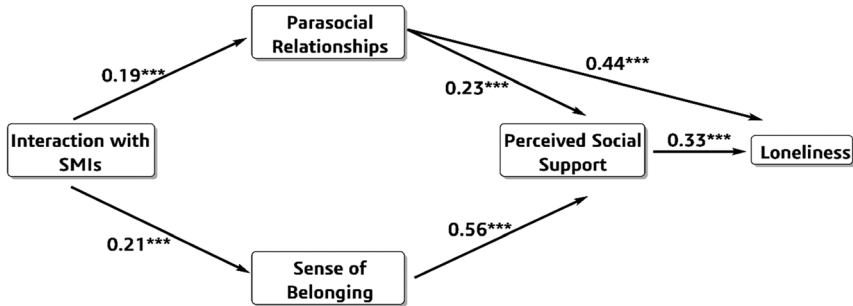


Figure 2: The serial mediation effect of interaction with SMIs on loneliness. Note: Unstandardized coefficients were reported. *** $p < 0.001$.

H3 expected that parasocial relationships and social support would mediate the relationship between interaction with SMIs and loneliness. The model results suggested a positive significant indirect effect between interaction with SMIs and loneliness through parasocial relationships and perceived social support, $b = 0.02$, $SE = 0.006$, 95 % CI [0.0045, 0.0291], and H3 was supported. Specifically, interaction with SMIs was positively related to parasocial relationships with the influencer, $b = 0.19$, $SE = 0.04$, $p < 0.001$. The parasocial relationship was positively associated with perceived social support, $b = 0.23$, $SE = 0.05$, $p < 0.001$. Last, perceived social support was positively associated with loneliness, $b = 0.33$, $SE = 0.06$, $p < 0.001$ (see Figure 2). As followers interact more with SMIs, their parasocial relationships with SMIs increase, which, in turn, increases perceived social support from the SMIs, but such perceived social support from SMIs also increases followers' sense of loneliness.

As for H4, it anticipated that sense of belonging mediates the association between interaction with SMIs and loneliness. The results showed a nonsignificant mediating effect $b = 0.04$, $SE = 0.02$, 95 % CI [-0.0009, 0.0891]. Therefore, H4 was rejected.

H5 anticipated that a sense of belonging and perceived social support would mediate the relationship between interaction with SMIs and loneliness. Results indicated a positive significant indirect effect between interaction with SMIs and loneliness through sense of belonging and perceived social support, $b = 0.04$, $SE = 0.01$, 95 % CI [0.0198, 0.0641]. Specifically, interaction with SMIs was positively related to the sense of belonging, $b = 0.21$, $SE = 0.04$, $p < 0.001$. Sense of belonging was positively associated with perceived social support, $b = 0.56$, $SE = 0.06$, $p < 0.001$. Last, perceived social support was positively associated with loneliness, $b = 0.33$, $SE = 0.06$, $p < 0.001$. H5 was confirmed. As followers interact more with SMIs, their sense of belonging to the SMI community increases, which, in turn, increases perceived social support

from the SMIs. However, such perceived social support from SMIs also increases followers' feelings of loneliness, as shown in Figure 2.

4 Discussion

Scholarly interest in SMI research has been growing, but past research often examines influencers' impact in the fields of online communities, marketing, and political context (Atef et al. 2023; Lou and Yuan 2019). Guided by the evolutionary theory of loneliness and prior research in parasocial relationships, sense of belonging, and social support, the study investigated the relationship between social media influencers and the followers' loneliness at a time when experiences of loneliness have risen because of the pandemic (Ernst et al. 2022). Even before the pandemic, social isolation and loneliness were becoming major public health and policy concerns due to their serious consequences on longevity, mental and physical health, and well-being (Holt-Lunstad et al. 2015). To the best of our knowledge, the current research is one of the first studies to date to explicate the mediating mechanisms of parasocial relationships, sense of belonging, and social support underlying the association between interaction with SMIs and loneliness.

4.1 Theoretical implications

First, the study contributes to an emerging literature that explores the adverse effects of SMIs on psychological well-being (Farivar et al. 2022). While past research has acknowledged that social media exerts both positive and negative influences on loneliness (Marciano et al. 2022; Phu and Gow 2019; Song et al. 2014), there is limited research investigating how interaction with SMIs affects loneliness, given the fact that different social media activities exert discrete psychological effects (Hunt et al. 2018; Pittman and Reich 2016).

Extending the evolutionary theory of loneliness to the context of SMIs, our study investigated the associations between interaction with SMIs and loneliness by explicating the mediation mechanisms. We examined parasocial relationships and sense of belonging as parallel mediators and perceived social support as a serial mediator in the relationship between SMI interaction and loneliness. First, the results show that parasocial relationships play a mediating role between interactions with SMIs and loneliness. This finding supports earlier research, indicating that bond-based attachments, like parasocial relationships, can negatively impact psychological well-being (Baek et al. 2013; Farivar et al. 2022). Extending Farivar et al.'s (2022) work, which linked parasocial relationships with SMIs to problematic

engagement, our study identifies an additional downside – these relationships are also positively correlated with feelings of loneliness among followers. This finding aligns with Baek et al. (2013), who found that dependency on parasocial relationships contributes to loneliness. As Stein et al. (2024) argue, parasocial relationships may create an illusion of social interaction, tricking the brain into perceiving connections as reciprocal or feeling attached to a media character, but they might not change how people evaluate their own social needs.

Moreover, in contrast to the majority of extant studies suggesting that low social support acts as an important antecedent of loneliness (Jackson et al. 2002; Kong and You 2013; Perlman and Peplau 1981), our findings indicate parasocial relationships with SMIs and social support mediate the association between interaction with SMIs and loneliness. Specifically, our study reveals that active interaction with SMIs leads to social attachment with influencers and increased social support, which is positively linked to a higher sense of loneliness. One reason could be that due to the high accessibility of social media and close bonds with SMIs, individuals may be more drawn to interactions with SMIs, and increase their time to communicate with SMIs. While individuals perceived an intimate connection with SMIs and gained social support from SMIs to potentially compensate for the lack of in-person support (O'Day and Heimberg 2021), they subsequently developed a higher feeling of loneliness. This finding is consistent with past research showing that social media use was associated with increased depression, higher loneliness, and declines in life satisfaction (Lin et al. 2022). The other reason could be that exposure to highly idealized SMIs can elicit feelings of envy by engaging in social comparison with influencers (Chae 2018). Consequently, these envious feelings may result in a sense of self-inferiority and loneliness over time due to the distorted belief that SMIs always live happier, more luxurious, or successful lives (Marwick 2015).

Second, the results of this study showed that a sense of belonging and social support mediate the relationship between SMIs and loneliness. As interacting with SMIs can gratify various psychological needs, the study indicated that individuals who communicated with SMIs were more likely to cultivate a sense of belonging to the influencers' community and help individuals get more social support. In contrast to the extant research indicating that increased perceived social support reduced loneliness (Deters and Mehl 2013; Jackson et al. 2002; Lin et al. 2022), findings reveal that interaction with SMIs might enhance loneliness despite the increased sense of belonging and social support.

While social media provide people with a platform for social interaction, and active interaction with SMIs is often utilized by individuals as a strategy for maintaining social contact and acquiring social capital and support (Lou 2022), our study reveals the negative consequences of interacting SMIs on users' mental health, such as increased sense of loneliness. This finding reflects "social snacking behaviors"

proposed by Gardner et al. (2005), who contend that individuals may resort to indirect social strategies to meet belonging needs when the tangible or in-person social connection is temporarily unavailable. Social snacking refers to “the temporary stopgaps to be used between opportunities for true social sustenance” (Gardner et al. 2005, p. 238). Like an actual snack that lacks nutritional content such as opportunities for meaningful interaction or social connection, some people may develop an illusion of a connection through parasocial relationships, a sense of belonging, and perceived social support. Such an imagined connection may be helpful to protect people from temporary isolation or loneliness, but it is not as satisfying or healthy as actual positive social interaction. In other words, our study suggests that interaction with SMIs may help users develop intimate connections and gain social support, but it does not reduce loneliness.

This finding advanced the evolutionary theory of loneliness by highlighting a critical distinction between the *quantity* and *quality* of social contact. The study suggests that it may not be merely the frequency or extent of contact that matters, but the *quality* of the connection. For interactions to reduce loneliness, they typically need to be deeper, more mutual, and based on reciprocal understanding and emotional exchange (Tejada et al. 2020). Interactions with SMIs are often one-sided and lack the depth required for genuine social fulfillment. While followers may feel they receive emotional or social support from an SMI, it doesn’t fully replace meaningful, real-world relationships. Thus, interaction with SMIs is not built on genuine two-way relationships but is more about perceived intimacy (Stein et al. 2024).

Notably, our finding differs from previous research suggesting active social media use helps reduce loneliness through enhanced social support (Lin et al. 2022). Such contradictions may be attributed to the nature of interacting with SMIs, which affects loneliness through serial mediators. Our study illustrates that interaction with SMIs affects parasocial relationships, sense of belonging, and social support, which consequently influence loneliness. This has important implications for how we conceptualize the role of social media influencers in the modern information environment. The study provides empirical support and is a starting point for future research on SMIs’ impacts on emotional, social, and psychological well-being. Findings from the study contribute to the scholarly works investigating the adverse effects of following and interacting with SMIs (Farivar et al. 2022).

4.2 Practical implications

Daily consumption of content created by influencers has growingly become a routine for many people. SMIs are an increasingly pervasive global phenomenon with the potential to exert influence on followers. By recognizing the dual role of SMIs as both

enhancers of social support and potential contributors to loneliness, the current study provides important practical implications for both followers and public health organizations. Past research indicated that SMIs exert negative impacts on problematic engagement (Farivar et al. 2022), body image (McComb and Mills 2021), and anxiety (Kirkpatrick and Lee 2022), but the dark side of this phenomenon on loneliness needs further attention. Our study suggests that while interactions with SMIs may foster parasocial relationships, a sense of belonging, and social support, they can paradoxically also increase feelings of loneliness. This indicates that SMIs can act as a double-edged sword, namely providing social bonds but simultaneously amplifying loneliness. Given that loneliness poses serious risks to both mental and physical health, it is critical for followers to be aware of their emotional attachment to SMIs and the potential adverse effects on their well-being. Public health organizations might benefit from creating educational campaigns that raise awareness about the negative impacts of SMIs on loneliness, encouraging individuals to maintain healthy real-life social connections, and utilize resources available for those struggling with loneliness.

4.3 Limitations

Our study has certain limitations. First, the study does not collect other control variables such as social media use and the total amount of SMIs that participants have followed over the past. It is important to examine other factors to elucidate further the dynamic processes of the effects of SMIs on loneliness. Also, we did not investigate the followers' goal orientation in their interaction with SMI. Social comparison with SMIs may also be an important factor to consider. Future studies incorporating any of these factors will further define the relationships between SMI interaction and loneliness.

Second, the key concepts in this study are relationship-based. We attempted to capture genuine relationships by requiring survey participants to name one SMI with whom they most often interacted within the last 30 days, and then answer the rest of the questions about the specific SMI. Nonetheless, we relied on the participants' self-reported answers from a cross-sectional survey. We did not manipulate or assess the actual communication behavior between followers and influencers. To overcome these shortcomings, future research may involve an experimental design with manipulation of the SMI interaction or a longitudinal study with measurement over time to test causal relationships.

Lastly, the current study is limited to investigating the relationship between follower-SMI interaction and loneliness. People interact with a diverse group of people on social media (friends, family, celebrities, influencers, etc.). A future study may investigate how interaction with different groups of people on social media

affects the users' loneliness. Such comparison may offer insights into contradicting results from previous research on social media use in general and loneliness.

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