

Problematic Social Media Use and Perceived Social Isolation in Older Adults: A Cross-Sectional Study

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Keywords

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Abstract

Background: Social isolation in older adults is associated with numerous adverse health outcomes. In today's digital society, if individuals perceive themselves to be socially isolated, they can take steps to interact with others on social media platforms. Research with younger adults indicates that social media use is positively linked to social isolation. However, less is known about social media use and social isolation in older adults. **Objective:** The objective of this study was to investigate the possible association between social isolation and degree of social media use in older adults. **Methods:** Using Internet sources, we recruited 213 participants (79.8% female; mean age 62.6 years, SD 8.3) who responded to an online survey focusing on living situation, depression, social isolation, and 2 measures of social media use: estimated daily time on social media and problematic social media use. Next, using binary logistic regression, we assessed associations between social isolation and social media use. **Results:** Our analyses failed to identify a relationship between perceived social isolation and estimated daily time on social media; however, higher problematic social

media use was associated with higher perceived social isolation (OR 1.17). **Discussion and Conclusion:** Although no causal attribution can be made, our findings demonstrate an association between problematic social media use and perceived social isolation in older adults. Researchers conducting social media interventions in older adults should note this potential and monitor maladaptive use of these platforms. Overall, our results provide an important starting point for future studies on social media use and social isolation in older adults.

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Introduction

Social isolation occurs when individuals lack true social engagement and quality relationships with others [1]. This state, whether actual or perceived, is associated with numerous detrimental health conditions, including increased mortality, especially in older adults. For example, higher levels of social isolation in older adults are associated with greater incidence of stroke [2] and higher post-stroke mortality [3]. Moreover, individuals in impoverished social environments are at increased risk for a host of chronic diseases, including heart disease, kidney disease, diabetes, dementia, arthritis, cancer, and affective

psychiatric disorders [for review see 4]. Socially isolated older adults also exhibit a greater number of physical falls [5], and if they are hospitalized, for whatever reason, they are then more likely to be rehospitalized [6]. Importantly, social isolation increases the risk for all-cause mortality [7], independently of whether one's social isolation is objectively measured or perceived [8]. With the gravity of these health outcomes in mind, more research is needed to determine behaviors which are associated with isolation, as well as whether particular types of technology use could help to ameliorate social isolation in the elderly.

Several theoretical mechanisms, both neurobiological and cognitive, have been posited to account for the link between social isolation and health. For example, considerable neurobiological evidence demonstrates that loneliness and social isolation are linked with proinflammatory and neuroendocrine stress responses, increasing blood pressure, and reducing the immune response to infection [for review see 9]. Cognitively, it appears that social isolation impairs executive functioning and negatively affects social cognition, including trust in others, and processing of negative social stimuli [for review see 10]. In addition, it is also likely that neurobiological and cognitive effects of social isolation are reciprocal. Therefore, these neurobiological and cognitive results of social isolation may, in part, lead to the reduced health and longevity described above.

In addition to the above mechanisms, the brain's reward system has evolved to reinforce the development and maintenance of social connection with others. To explain, Baumeister and Leary [11] proposed their "Need to Belong" theory in 1995, advancing the idea that people today are driven to connect with others due to natural selection. The Need to Belong theory posits that our ancestors derived significant adaptive advantages from belonging to a group: for example, enhancing one's chances to obtain valuable resources (e.g., food) as well as enhancing one's ability to avoid predators. Therefore, individuals who had genes that predisposed them to find social interactions rewarding, and therefore belong to a group, derived key advantages, survived, and passed on their genes. As a result of this, it is thought that modern humans are hardwired to find social interactions rewarding and are driven to fulfill these social needs. In line with this, Baumeister and Leary [11] proposed that fulfilling these social needs is as important as obtaining other primary rewards such as food and sex. Importantly, similar to obtaining food and sex, the experience of connecting with others activates the brain's reward system [for review see 12, 13]. Therefore, it could be that individuals who do not receive enough of these primary social rewards feel socially isolated.

In today's digital society, if individuals feel socially isolated, they can take steps to interact with others online to obtain social rewards, for example on social networking sites (SNSs) like Facebook, Twitter, and Instagram. When individuals post content and comment on others' content, they indeed connect with others [12], and research has demonstrated that use of these platforms is linked to the reward system of the brain [14]; for example, simply receiving "likes" on social media activates the reward system [15]. Over 2.5 billion people worldwide use SNSs to satisfy their need to connect with others [16], and the prevalence of SNS use in older adults is considerable: 64% of individuals aged 50–64 years of age and 37% of individuals 65 years and older use these sites in the United States [17]. Though use of SNSs can help individuals connect with others, some prior research focusing on young adults has demonstrated a relationship between social media use and social isolation: young individuals who report more SNS usage also report more perceived social isolation [18, 19]. To note, the causal direction of this relationship has yet to be explicated. It could be that the more socially isolated an individual feels, the more social media they use in an attempt to alleviate their isolation; or it could be that the more social media an individual uses, the more socially isolated they feel. This second scenario, in which social isolation is induced by social media use, could result from certain behaviors or types of cognition while on social media (e.g., engaging in upward social comparison with others). No research has investigated these processes with regard to social isolation, but research has revealed that passive use of social media (e.g., scrolling without posting) and engaging in the cognitive process of social comparison leads to increased symptoms of depression and reduced well-being [20, 21]. Passive social media use, when done to excessive amounts, may also limit the amount of time available or prevent individuals from engaging in social interaction with others offline – which could result in greater perceived isolation. For older adults, who are more likely to have mobility impairments and cannot travel as easily to see social ties, isolation may be exacerbated if they use social media in excess. Therefore, it is important to simply understand if an association exists between social media use and social isolation in older adults, especially in light of the potentially serious consequences of perceived social isolation in these individuals.

Thus far, only a handful of studies have investigated the relationship between SNS use and social isolation in older adults, and the results have been mixed [19, 22]. For example, qualitative research has demonstrated that older adults reported feeling "less lonely" when using an SNS

[23]. Seemingly at odds with this, several quantitative studies have compared older adults who use SNSs with older adults who do not use SNSs, revealing no difference in loneliness between the groups [24–26]. Finally, with a lifespan sample consisting of individuals 15–75 years old, SNS users were revealed to be lonelier than nonusers [27]. Thus, prior quantitative studies on perceived social isolation in older adults have only compared SNS users with SNS nonusers. To the best of our knowledge, no study has yet examined if perceived social isolation varies with the degree of SNS use in older adults.

Importantly, degree of SNS use varies between individuals, at least in part because of how the human brain processes the myriad social rewards that SNSs provide [12, 14]. These reinforcing social rewards bring users back to SNSs repeatedly, with some users actually displaying maladaptive, problematic SNS use [28]. Problematic SNS users display symptoms and behaviors (e.g., decision-making [29]) similar to individuals with substance use disorders. For example, they exhibit a preoccupation with SNS platforms, as well as experience mood modification when they use these sites. Problematic SNS users may also experience conflict with others because of their use, and when attempting to quit, they may display withdrawal symptoms and often relapse [28]. Problematic social media use has been well documented in younger adults, and several studies have demonstrated a positive relationship between problematic Internet use and social isolation in this demographic [for review see 19], but there has been a lack of research on the topic in older adults. To the best of our knowledge, no study has yet assessed problematic SNS use in older adults to investigate its relationship to social isolation.

We hypothesized that the positive relationship seen between social isolation and degree of SNS use in younger adults [18] is also manifest in older adults. To address this, we collected online survey data from individuals 50 years of age and older. We obtained demographic information, a measure of perceived social isolation, and 2 measures to ascertain degree of social media use: (1) estimated daily time on SNSs and (2) the Bergen Social Media Addiction Scale (BSMAS) [30, 31] to assess their degree of problematic SNS use. We then analyzed our data, assessing if a relationship between social isolation and degree of SNS use exists in older adults. Of note, we also collected a measure of depression. Previous research on both social isolation and social media use has demonstrated that these factors are associated with depressive symptoms [32, 33]. We therefore controlled for depression in our analyses, similar to previous research on social media use [29].

Materials and Methods

Study Sample

We recruited participants aged 50 years and older via emails to community senior centers, activity clubs, and various religious organizations across a state in the Midwest United States. These organizations then emailed our survey to their members or posted our survey to their social media channels. Participants were incentivized to complete our survey by entry into a lottery for 1 of 5 USD20 Amazon gift cards. The final sample size consisted of 213 participants, after excluding 15 survey respondents who entered “other/prefer not to answer” either for their gender or living situation, 1 survey respondent who entered “group/communal” for their living situation, 1 survey respondent for being an outlier on our measure of problematic social media use (>5 SD from the mean), and 2 survey respondents who entered that they use >600 min of social media each day (600 min of social media use per day has been used as an exclusion criterion in prior research [34]). For descriptive statistics about sample demographics, please see Table 1. Of note, our sample consisted of 203 (95.3%) white, non-Hispanic individuals, 3 (1.4%) black, non-Hispanic individuals, 2 (0.9%) Hispanic individuals, and 5 (2.3%) individuals who chose to not report their race. After all data collection, we randomly selected 5 participants and sent them their gift card.

Measures

Data were collected through an online survey using the Qualtrics Research Suite. We asked participants questions regarding their social media use, social isolation, living situation, as well as age and gender:

Estimated Daily Time on Social Media. We asked participants the following question to obtain their estimated daily time on social media: “Please approximate how much time per day you spend on social media for personal use (not work reasons). By social media, we mean online social networking platforms, such as Facebook, Twitter, and other similar sites. Please include time on computers and also mobile devices like phones and tablets.” We then provided 2 drop-down menus for response: hours (range 0–23) and minutes (range 0–59).

Problematic Social Media Use. We used the BSMAS to assess problematic social media use [30]. Originally designed to specifically assess use of the Facebook platform, the scale has been adapted to assess general problematic social media use by replacing the word “Facebook” in each item with “social media” [31]. The BSMAS consists of 6 items rated on a 5-point Likert scale (from 1 = very rarely to 5 = very often). Each BSMAS item assesses a commonly accepted core aspect of addiction: salience (preoccupation), mood modification, tolerance, conflict, withdrawal, and relapse [28]. For example, the item concerning withdrawal asks: “Do you become restless or troubled if you are prohibited from using social media?” Therefore, the BSMAS assesses one’s psychological dependence on social media. The reliability and validity of the BSMAS have been established previously [30], and the internal consistency with our sample was similarly acceptable (Cronbach’s $\alpha = 0.70$).

Perceived Social Isolation. We used the Patient-Reported Outcomes Measurement Information System (PROMIS) social isolation scale to assess participants’ perceived social isolation. PROMIS is an NIH road map initiative that aims to develop, validate, and standardize questionnaires measuring patient-reported outcomes

Table 1. Summary of demographic characteristics and variables of interest, including comparisons across social isolation groups

Variable	All participants (<i>n</i> = 213)	Low social isolation (<i>n</i> = 112)	High social isolation (<i>n</i> = 101)	Statistic	<i>p</i> value
Age, years	62.6 (8.3)	63.5 (8.2)	61.5 (8.3)	<i>t</i> = 1.70	0.09
Gender				$\chi^2 = 0.30$	0.58
Female	170 (79.8)	91 (81.3)	79 (78.2)		
Male	43 (20.2)	21 (18.8)	22 (21.8)		
Living situation				$\chi^2 = 2.91$	0.09
Alone	52 (24.4)	22 (19.6)	30 (29.4)		
With significant other	161 (75.6)	90 (80.4)	71 (70.3)		
Depression	5.9 (2.6)	4.5 (1.1)	7.5 (2.8)	$\chi^2 = 56.51$	<0.001
Estimated daily minutes on social media	133.1 (92.9)	132.1 (92.6)	134.2 (93.7)	<i>t</i> = -0.16	0.87
Problematic social media use	9.9 (3.0)	9.2 (2.6)	10.7 (3.1)	<i>t</i> = -3.80	<0.001

Data are presented as means (SD) or *n* (%). *t*, independent-samples *t* test; χ^2 , χ^2 independence test.

across the domains of physical, mental, and social health [35]. The PROMIS social isolation scale was developed using item response theory to promote survey accuracy and decrease the burden on survey respondents [36–38]. This social isolation scale has been validated against, and shown to correlate with, other commonly used social isolation measures [39, 40]. The PROMIS social isolation scale consists of 4 items that assess participants' perceptions of being left out, isolated, and detached from others. Specifically, it asks "In the past 7 days, how frequently did you experience the following: (1) I felt left out, (2) I felt that people barely know me, (3) I felt isolated from others, and (4) I felt that people are around me and not with me." Items are scored on a 5-point Likert scale (from 1 = never to 5 = always). The internal consistency of the scale with our sample was good (Cronbach's $\alpha = 0.87$). Of note, summed PROMIS social isolation data were not normally distributed and were not amenable to transformation into normally distributed data. Therefore, we performed a median split on summed scores to dichotomize the data into low (total score ≤ 5) and high (total score ≥ 6) social isolation groups for analyses. In our analyses, the low group was coded as 1 and the high group was coded as 2.

Depression. We assessed participants' depressive symptoms with the 4-item PROMIS depression scale. Like the PROMIS social isolation scale, the PROMIS depression scale was developed using item response theory to promote survey accuracy and decrease the burden on survey respondents [36–38]. In addition, this depression scale has been validated against, and shown to correlate with, other commonly used depression measures [41, 42]. The PROMIS depression scale asks "In the past 7 days, how frequently did you experience the following: (1) I felt worthless, (2) I felt helpless, (3) I felt depressed, and (4) I felt hopeless." Items are scored on a 5-point Likert scale (from 1 = never to 5 = always). The internal consistency of the scale with our sample was good (Cronbach's $\alpha = 0.89$). Of note, summed PROMIS depression data were not normally distributed and were not amenable to transformation into normally distributed data. Therefore, we performed a median split on summed scores to dichotomize the data into low (total score = 4) and high (total score ≥ 5) depression groups for analyses. In our analyses, the low group was coded as 1 and the high group was coded as 2.

Living Situation. We assessed participants' living situation with one survey item. We asked, "What is your living situation?" and provided participants with the following 5 response options: alone; with a significant other; with a caretaker; group/communal living; and other/prefer not to answer. No respondents lived "with a caretaker" and, as mentioned above, only 1 respondent answered with "group/communal", so we excluded this individual from analyses. In our analyses, "alone" was coded as 1 and "with a significant other" was coded as 2.

Age. We asked participants to enter their date of birth and provided them with 3 drop-down menus: month (range January to December), day (range 1–31), and year (range 1900–1970). We then calculated their age in years based on the date they completed the survey. Of note, at the start of the survey participants were asked to indicate (yes or no) that they were at least 50 years of age. If they responded in the negative, they were not able to continue the survey. As a result, every age calculated from the date of birth entry was acceptable for inclusion in the study with regard to the 50-year age cutoff.

Gender. We asked participants to enter their gender and provided them with 3 response options: male; female; and other/prefer not to answer. In our analyses, "male" was coded as 1 and "female" was coded as 2.

Data Analysis

All analyses were performed with SPSS software (version 25; IBM Inc., Armonk, NY, USA). Initial comparisons were conducted between our demographic variables and measures of interest: age, gender, living situation, estimated daily minutes on social media, problematic social media use, and social isolation. Zero-order Pearson product-moment correlations were computed when comparing 2 continuous variables; χ^2 tests of independence were computed when comparing 2 dichotomous variables; and independent-samples *t* tests were computed when comparing 1 dichotomous and 1 continuous variable (see reported test statistics for type of comparison). Next, to fully address our hypothesis, we conducted a hierarchical logistic regression with 4 blocks, the first including age, gender, and living situation, the next adding depressive symptoms, the third adding estimated daily minutes on social media, and the final block adding problematic social media use.

Results

We provide a summary of demographic characteristics and measures of social media use with respect to perceived social isolation group in Table 1. Of note, our sample had a mean age of 62.6 years (SD 8.3; range 50–83); a high proportion of female respondents (79.9%); a high proportion of white, non-Hispanic respondents (95.3%); and most respondents lived with a significant other (75.6%). Participants' mean score on the PROMIS depression scale was 5.9 (SD 2.6; range 4–16). Of note, a score of 6 on this scale translates into a T-score metric of 51.8 (SE 2.7) and a T-score of 50 represents the average score of the US population [43]. With regard to social media use, participants' mean estimated daily time on social media was over 2 h (mean 133.1 min; SD 92.9), and their mean score on the BSMAS was 9.9 (SD 3.0; range 6–20). This BSMAS mean is comparable to the findings of a recent large-scale, national survey in Norway that revealed individuals 46 years of age and older to have BSMAS scores on average between 8 and 9 [31]. With regard to perceived social isolation, participants' mean score on the PROMIS social isolation scale was 6.3 (SD 2.7; range 4–15). Of note, a score of 6 on this scale translates into a T-score metric of 43.3 (SE 2.8), and a T-score of 50 represents the average score of the US population [44].

In Table 1, we also present the results of our initial social isolation group comparisons. Age, gender, and living situation did not significantly differ with regard to social isolation, although these analyses revealed trends for age and living situation, with p values below 0.1. We did find a significant difference in our measure of depression across social isolation groups: individuals reporting greater depressive symptoms were more likely to report greater perceived social isolation. With respect to our hypothesis, we observed no significant difference in estimated daily minutes on social media across social isolation groups. However, we did observe a significant difference in problematic social media use across social isolation groups: individuals with less problematic social media use were more likely to report low perceived social isolation while individuals with more problematic social media use were more likely to report high perceived social isolation.

Prior to computing regression analyses (see below), we next examined potentially relevant demographic variables and our depression measure for significant associations with our factors of interest. Our analyses revealed 5 significant bivariate relationships: age was negatively associated with problematic social media use ($r = -0.17, p < 0.01$), in which younger age was linked with more prob-

lematic use; participants living alone were significantly older than those cohabitating ($t = 3.71, p < 0.001$); women estimated they spent more time per day on social media than men ($t = 3.67, p < 0.001$); participants reporting more depressive symptoms displayed more problematic social media use ($t = 2.90, p < 0.001$); and participants' estimated daily minutes on social media was positively associated with participants' problematic social media use ($r = 0.30, p < 0.001$). All other comparisons between our measures were not significant ($p > 0.05$).

With the above results in mind, we conducted a hierarchical logistic regression to assess the relationships between the factors in our models – we wanted to ascertain the extent that demographic variables (block 1), depressive symptoms (block 2), estimated daily minutes on social media (block 3), and problematic social media use (block 4) predicted perceived social isolation in people aged 50 and older. Results are presented in Table 2. Overall, our models were significant, explaining 5% (block 1), 35% (block 2), 35% (block 3), and 38% (block 4) of the variance in perceived social isolation. Both living situation and age were significant in the first model but were no longer significant when depression was added in block 2. In Blocks 2, 3, and 4, depression was significantly associated with perceived social isolation and explained the majority of the variance. Counter to our hypothesis, estimated daily minutes on social media, when added to our model, was not significantly associated with perceived social isolation. However, in line with our hypothesis, we found that problematic social media use was significantly associated with perceived social isolation, when controlling for depression and other variables. In other words, the greater an individual's problematic use of social media, the more likely they perceived themselves to be socially isolated.

Discussion

The present study yielded several notable findings regarding the relationships between SNS use and social isolation in adults aged 50 years and older. First, in accord with our initial hypothesis, problematic social media use was indeed associated with higher levels of social isolation. Importantly, this relationship was significant when controlling for depression. Surprisingly, however, we found no relationship between estimated time on social media and perceived social isolation. In other words, although self-reported time on social media was not a reliable predictor of social isolation, self-reported problematic SNS use was.

Table 2. Hierarchical logistic regression with demographic characteristics and variables of interest predicting perceived social isolation

Variable	Block 1		Block 2		Block 3		Block 4	
	β (SE)	OR (95% CI)	β (SE)	OR (95% CI)	β (SE)	OR (95% CI)	β (SE)	OR (95% CI)
	$\chi^2 = 8.23^*$ $R^2 = 0.05$ $-2LL = 286.48$		$\chi^2 = 64.80^{***}$ $R^2 = 0.35$ $-2LL = 229.91$		$\chi^2 = 64.98^{***}$ $R^2 = 0.35$ $-2LL = 229.74$		$\chi^2 = 71.26^{***}$ $R^2 = 0.38$ $-2LL = 223.45$	
Age	-0.04 (0.02)	0.96* (0.93/0.99)	-0.04 (0.02)	0.96 (0.93/1.00)	-0.04 (0.02)	0.96 (0.93/1.00)	-0.03 (0.02)	0.97 (0.93/1.01)
Gender (ref. = female)	0.23 (0.35)	1.25 (0.63/2.49)	0.40 (0.41)	1.49 (0.67/3.30)	0.44 (0.42)	1.56 (0.68/3.57)	0.48 (0.43)	1.62 (0.70/3.76)
Living situation (ref. = with sig. other)	0.75 (0.34)	2.12* (1.09/4.15)	0.52 (0.40)	1.68 (0.77/3.65)	0.51 (0.40)	1.66 (0.76/3.62)	0.51 (0.41)	1.66 (0.75/3.69)
Depression (ref. = high symptoms)			-2.30 (0.33)	0.10*** (0.05/0.19)	-2.30 (0.33)	0.10*** (0.05/0.19)	-2.22 (0.34)	0.11*** (0.06/0.21)
Estimated daily minutes on social media					0.00 (0.002)	1.00 (0.99/1.004)	0.00 (0.002)	1.00 (0.99/1.003)
Problematic social media use							0.16 (0.06)	1.17* (1.03/1.33)

* $p < 0.05$, *** $p < 0.001$; -2LL, -2 log likelihood.

Our results are in line with the above-discussed Need to Belong theory and theory on behavioral addictive disorders, even though our results are correlational and do not reveal a causal relationship between problematic social media use and perceived social isolation. To explain, the association we revealed can be interpreted in one of 3 ways: (1) the more socially isolated older adults feel, the more they display problematic SNS use, (2) the more problematic older adults' use of social media is, the more socially isolated they feel, or (3) the observed relationship between problematic social media use and perceived social isolation is the result of a third variable that is driving both problematic social media use and perceived social isolation. The first scenario relies on the above theories, in that, if humans evolved to find social connections rewarding, they will pursue these primary social rewards in the real world, or online, using social media platforms. Therefore, an older adult who has not satisfied their need for social rewards and feels socially isolated may turn to social media to alleviate this feeling. If this individual cannot obtain enough social reward on social media platforms, this use could then become problematic.

The second scenario also relies on the above theories. To explain, the myriad social rewards available on social media are reinforcers, which lead older adults to return to these platforms to perform the same behaviors to receive more rewards. Importantly, similar to substance use and behavioral addictive disorders, these frequent and copious social reinforcers may lead some individuals to de-

velop maladaptive, problematic use of these sites. In turn, the use of these sites may then lead older adults to feel socially isolated. This could occur through any of the theoretical mechanisms that we presented in the Introduction, such as engaging in upward social comparisons on social media. Although we did not address these mechanisms with the present research, our findings have demonstrated, for the first time, a link between problematic social media use and perceived social isolation in older adults.

The third scenario results if there is no causal relationship between problematic social media use and perceived social isolation. Although we controlled for living situation and depressive symptoms, among other factors in our analyses, it remains possible that the observed relationship between problematic social media use and perceived social isolation may be explained by a third, unmeasured variable. This third variable could be causing both social isolation and problematic social media use. Future research that includes additional measures of other relevant dimensions, such as personality, physical health, and mental health, will be better able to address this issue.

As mentioned, our results are correlational in nature, and a causal relationship cannot be determined with the current cross-sectional dataset. Further research (e.g., with studies that are longitudinal in design) is needed to determine which of the above scenarios is correct. Of note, understanding causal directionality with future research is critical, especially considering the introduction of technological interventions to combat social isolation in older

adults [45]. If the second scenario above is true, it could be that interventions which introduce social media to counter social isolation in older adults may lead to maladaptive, problematic use of these sites in certain individuals, possibly resulting in increased perceptions of social isolation in these individuals. This unfortunate circumstance would yield the exact opposite effect of the intervention's intended goals.

The present study includes several other limitations, in addition to lacking a causal explanation, that warrant mention. First, all data were collected online. This online survey methodology may have introduced noise or bias into our data set because participants could have been distracted (e.g., watching TV, talking with others, etc.) while they responded to our questions. Second, all data were self-reported, which may also have introduced noise or bias into our data set. For example, we did not observe a relationship between estimated daily time on social media and perceived social isolation, and this could have been due to poor estimation. Recent studies in younger adults have revealed that estimating daily SNS use is quite difficult and does not correlate as strongly with recorded actual time as one would expect [46]. Older adults may encounter even more difficulty when estimating time spent on SNSs, and this noise could mask a true association between time spent on social media and perceived social isolation. Third, we did not ascertain the work status of our sample, so we did not include this in our analyses. Given that our study focuses on those aged 50 years and older, it is likely that a significant portion of respondents are still in the workforce. It could be that individuals in the workforce may be less socially isolated than those retired or not working. Finally, our sample is possibly not representative of all older adults who use SNSs and should be interpreted with caution. For example, as mentioned above, almost 80% of our sample was female; 95% of our sample was white, non-Hispanic; our entire sample was located within one state in the US Midwest; our sample of older adults was aged 50 years and older when many studies consider 65 years and older to comprise older adults; and we recruited specifically from activity and community organizations. Therefore, future research is needed in large, more diverse samples, representative of the US population, to better understand the nature and prevalence of these effects.

Our results have important implications for both the field and society. First, although various types of technology use, including general Internet use, may have beneficial outcomes for older adults [47–49], researchers conducting social media interventions in older individuals should take note of our findings and monitor maladaptive

use of social media platforms. We should not assume that only young persons may be using SNSs in problematic ways. In addition, given the associations between social isolation and risk for financial exploitation [50], understanding the potential interplay of maladaptive social media use with financial vulnerability in older adults is an ever more salient concern. Furthermore, the prevalence of social media use by older adults will most likely continue to grow as current users age and other older adults start using these platforms. Given that social isolation is related to a range of negative health outcomes for older adults, understanding how technology use, and SNS use more specifically, may relate to social isolation will be critical as increasing numbers of older adults use these sites. With the above in mind, our research provides an initial foundation, addressing the lack of research on older adults' use of social media and social isolation.

Many questions regarding problematic social media use and social isolation remain. For example, we currently do not know the prevalence of problematic social media use in older adults; in particular, how common are severe cases? In addition, does this problematic use lead to social isolation, or does social isolation lead to increased SNS use? And, how does SNS use relate to other well-being outcomes among older adults? These are all questions which will require more extensive, longitudinal designs. Overall, our findings provide an important starting point for future studies on problematic social media use and social isolation in older adults. We encourage others to build upon this initial study to try to minimize social isolation among older adults.

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Statement of Ethics

Study procedures were carried out in accordance with the Declaration of Helsinki and approved by the Ethics Review Committee of our university. All participants provided informed consent.

Disclosure Statement

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