Facebook Use and Its Role in Shaping Access to Social Benefits among Older Adults

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Adults who are 65 years or older have increasingly adopted social network sites (SNSs), Facebook in particular. Yet the ramifications of SNS use in this population remain understudied. Using a nationally representative sample of U.S. adults (N = 2,003), this study focuses on Facebook users (N = 1,138) and examines patterns of Facebook use by younger (aged 18–65 years) and older users (aged 65 or older), as well as the social benefits associated with older users' Facebook use. Findings show that older users have different network structures, but the frequency of their visits and engagement in Social Media Relationship Maintenance Behaviors (SMRMB), a measure of perceived likelihood to engage with others via social media, do not significantly differ from those of younger users. Moreover, our results suggest that among older users (N = 98), the number of self-reported "actual" friends on Facebook and SMRMB positively predict perceived support, while SMRMB contributes to perceptions of access to useful information. Overall, the study highlights unique usage patterns and social benefits associated with Facebook use among older adults. As such, its findings provide insights for the future design of technological interventions to help older adults better access social benefits associated with SNS use.

Introduction

While it is widely recognized that social relationships and interactions have a powerful positive impact on older adults' physical and mental health (e.g., Berkman, Glass, Brissette, & Seeman, 2000), later life can be a time of particular challenges with regard

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to social connectedness due to age-related changes, such as retirement and health declines. This paradox faced by older adults has prompted some to argue that social network sites (SNSs) can help older adults receive social benefits (Nef, Ganea, Müri, & Mosimann, 2013). Indeed, as there is evidence that older SNS users perceive higher levels of support and feelings of connectedness to a network of friendship than older non-users (Yu, McCammon, Ellison, & Langa, 2015), scholars have proposed technological interventions that integrate SNS features to facilitate communication with others and acquisition of related social benefits for older adults. Examples include digital displays of family photos and messages (Cornejo, Tentori, & Favela, 2013) and a health-related telecommunication system using Facebook features (Huang & Hsu, 2014). Meanwhile, online seniors are increasingly adopting SNSs, Facebook in particular. Facebook's adoption rate among online seniors over 65 years has quadrupled from 13% in 2009 to 56% in 2014 (Duggan, Ellison, Lampe, Lenhart, & Madden, 2015). However, as substantial literature on SNS use has focused on younger age groups, relatively little is known about older adults' SNS usage patterns and whether the social benefits associated with SNS use for younger age groups can be made available to older populations.

With a focus on Facebook—the most widely used SNS among all U.S. adults, including older adults (Duggan et al., 2015)—we use a nationally representative sample of U.S. adults from the 2014 Pew Internet and American Life Project to address two important empirical questions. First, drawing on previous work on Facebook use and social capital (Ellison, Steinfield, & Lampe, 2007, 2011; Ellison, Vitak, Gray, & Lampe, 2014), we consider various activities on the platform, including Facebook users' network characteristics (i.e., the number of total friends, perceptions of "actual" friends on the site, and the ratio of "actual" to total friends) and forms of Facebook use (i.e., frequency of Facebook visits and an individual propensity to actively engage with others via social media, called Social Media Relationship Maintenance Behaviors (SMRMB)) and ask: Are there systematic differences in Facebook use between younger (18–65) and older (65+) users? Second, based on the distinctions between bridging social capital (i.e., social benefits associated with weaker ties, such as useful information) and bonding social capital (i.e., social benefits associated with stronger ties, such as social support), we consider two types of social benefits, namely perceptions of support and access to useful information, and ask: How are perceptions of support and access to useful information associated with different Facebook activities in the older population? Overall, our goal is to draw on perspectives from social capital and life course theories to examine unique patterns of Facebook use and associated social benefits, with the hope that our results can help inform technological interventions designed to facilitate the benefits of SNS use for this population.

Facebook Usage Differences between Older and Younger Users

Because prior work has demonstrated that Facebook network characteristics, such as the number of total friends, perceptions of "actual" friends on the site, and the ratio of "actual" to total friends (Chang, Choi, Bazarova, & Löckenhoff, 2015; Ellison

et al., 2011) and forms of Facebook use, such as frequency of Facebook visits and Facebook Relationship Maintenance Behaviors (Ellison et al., 2007, 2014), are associated with increased levels of social benefits, it is important to examine how these activities differ by younger (18–65) and older (65+) age groups. We use age 65 to divide the sample into two groups because "older adults" generally refer to those aged 65 and over (e.g., Ortman, Velkoff, & Hogan, 2014). Furthermore, while prior work has explored how SNS use patterns change over the lifespan among those aged 18 and older (Chang et al., 2015) and how SNS use is associated with access to social capital among younger age groups (e.g., Ellison et al., 2011), relatively little research examines SNS use and its related social benefits among older adults in particular. Thus, we first examine whether and how older adults' Facebook network characteristics and forms of use are different from the rest of the population in order to understand unique SNS usage patterns among older adults. Then, we focus on the older population and investigate how their SNS practices are associated with perceptions of support and access to useful information.

Facebook Network Characteristics

We first examine how Facebook network characteristics, including number of total friends, perceptions of "actual" friends, and ratio of "actual" to total friends, differ by younger and older age groups. As Facebook allows users to create "social supernets," consisting of hundreds or even thousands of friends (Donath, 2007) that range from distant acquaintances to close friends, social capital researchers (Ellison et al., 2011, 2014) often ask survey participants to report both the total number of Facebook friends they have as well as the number of network connections on the site they perceive to be "actual" friends. The number of total friends refers to one's friend count on the site, whereas the number of "actual" friends taps into perceptions regarding stronger connections that may not be truly close ties (Ellison et al., 2011). The distinction between the number of total friends and "actual" friends is important because research shows that the latter is more predictive of access to social capital than the former (Ellison et al., 2011, 2014). Using a college student sample, Ellison et al. (2011) found that the reported median number of total Facebook friends was 300; of this, about 25% or 75 were considered "actual" friends. Given the high number of perceived "actual" friends, Ellison et al. (2011) suggest that "actual" friends may not be truly close or intimate contacts, but are likely to be individuals with whom respondents have a "stronger offline connection" (p. 888). To capture the composition of one's Facebook network, the ratio of "actual" to total friends is the perceived proportion of stronger offline connections in a user's Facebook network. Research evidence shows that there is a negative association between the ratio of "actual" to total friends and loneliness (Chang et al., 2015).

Although Facebook's technical options generally support users to connect with both intimate and distant others (Bakshy, Rosenn, Marlow, & Adamic, 2012), some older adults' Facebook network characteristics may differ from their younger

counterparts as social relationships change over the life course. Since prior work suggests that an individual's offline social network tends to become smaller and narrower as age increases (Antonucci & Akiyama, 1987; Carstensen, 1993), we might expect that older adults would have fewer total Facebook friends but a higher proportion of "actual" friends in the network, compared to younger age groups. A meta-analysis of age-related offline social network changes found that family network size remains stable throughout the lifespan while global and friendship networks expand during young adulthood and decrease during later adulthood (Wrzus, Hänel, Wagner, & Neyer, 2013). The gerontology literature has suggested two perspectives—involuntary and voluntary loss hypotheses—to explain why social network size and composition change with age. Involuntary loss hypothesis suggests that older adults often involuntarily lose weak social contacts and miss opportunities to extend existing networks due to age-related factors, such as mandatory retirement and bereavement (e.g., Antonucci & Akiyama, 1987). In contrast, the voluntary loss hypothesis posits that older adults tend to proactively reduce contact with less close others in order to prioritize close relationships that are emotionally rewarding (e.g., Carstensen, 1993). Consistent with these perspectives, prior work on SNS networks also shows that as age increases, number of friends decreases (Barker, 2012), while the proportion of "actual" friends increases (Chang et al., 2015). Thus, we expect that older adults will have a smaller number of total Facebook friends and a higher ratio of "actual" to total friends, compared to younger users.

However, it is not clear whether the number of perceived "actual" friends differs by age groups because prior work (e.g., Chang et al., 2015) does not do such comparisons. Prior gerontology literature suggests two possibilities. On the one hand, older users' perceptions of "actual" friends may not differ from younger users because research suggests that an individual's core social network tends to remain stable across the lifespan (e.g., Wrzus et al., 2013). On the other hand, older users may perceive fewer "actual" friends than younger users, because older users may be more likely to lose stronger ties due to age-related reasons, such as bereavement, than younger users. Based on the above, we pose the following hypotheses and research question:

H_1: Older Facebook users have (a) a smaller number of total Facebook friends and (b) a higher ratio of "actual" to total friends, compared to younger users.

RQ_1: Does the number of "actual" friends on Facebook differ by younger and older age groups?

Forms of Facebook Use

Next, we explore how forms of Facebook use differ by age groups. It is unclear how older adults' practices on the platform, including (1) frequency of Facebook visits and (2) likelihood of engaging in SMRMB, are different from their younger counterparts. First, existing research has provided ambivalent evidence regarding how frequency of

Facebook use differs by age groups. Some research suggests that older adults may be less likely to engage in various Facebook activities, including frequency of use, than younger adults because the ability to perform tasks on the Internet is increasingly determined by physical conditions, such as cognitive ability (Czaja, Sharit, Hernandez, Nair, & Loewenstein, 2010). For example, in a usability test, Brandtzæg, Lüders, and Skjetne (2010) found that compared to younger users, older users were less likely to complete the tasks that involved navigating Facebook's privacy settings. When older users were able to complete the tasks, they took more time to do so. However, other evidence may suggest otherwise. As the proportion of Facebook users who engage with the site daily has significantly increased, from 63% in 2013 to 70% in 2014 (Duggan et al., 2015), older adults may have increasingly integrated Facebook use into their daily life, contributing to the increase in the proportion of daily Facebook users. Indeed, there is evidence that some older adults have integrated SNSs into their daily routines so that they can stay connected with their family and friends (Karimi & Neustaedter, 2011).

Second, it is also unclear whether the likelihood of engaging in Social Media Relationship Maintenance Behaviors (SMRMB), which measures a person's perception of how likely he or she is to engage in interactions that signal attention to the recipient and help to form social bonds and trust with the recipient (Ellison et al., 2014), differs by age groups. Some evidence shows that older adults have high privacy concerns regarding SNS use (Brandtzæg et al., 2010; Xie, Watkins, Golbeck, & Huang, 2012) and feel uncomfortable about sharing their thoughts in front of a broad audience on Facebook (Lehtinen, Näsänen, & Sarvas, 2009). A recent survey study also reveals that as age increases, Facebook users are less likely to engage in self-posting behaviors (Chang et al., 2015). Due to privacy concerns, one may expect that, compared to younger users, older adults may be less likely to engage in SMRMB because some of these actions may be publicly viewable. However, other evidence suggests that older users' likelihood of engaging in SMRMB may not differ from their younger counterparts. In an interview study, Erickson (2011) found that while older users may not feel comfortable broadcasting themselves (e.g., self-posting) on Facebook, they are more willing to provide support to others on Facebook in the form of sending messages (e.g., birthday wishes and get-well-soon messages). Consistent with Erickson's (2011) findings, a recent study using a convenience sample of individuals across a wide range of ages also shows that frequency of commenting on friends' photos and status/posts did not differ across three age groups (18–29, 30–49, and 50+) (Hayes, van Stolk-Cooke, & Muench, 2015). The behaviors (e.g., sending birthday wishes and commenting on friends' posts) described in the studies are generally consistent with activities measured by the SMRMB scale. This literature suggests that older adults may be as likely as their younger counterparts to perform SMRMB.

In summary, given opposing perspectives and expectations regarding older adults' Facebook use, we pose the following research questions:

RQ$_2$: Do (a) frequency of Facebook visits and (b) likelihood of engaging in SMRMB differ by younger and older age groups?

Facebook Use and Social Benefits among Older Facebook Users

After identifying unique Facebook usage patterns among older adults, we draw on the theoretical framework of social capital to further examine how these usage patterns relate to access to social benefits in the older population. While social capital generally describes resources embedded in social relationships, it is often divided into "bridging" and "bonding" capital based on the types of relationships in which the resources are embedded (Putnam, 2001). Weaker ties are more likely to be bridging ties that connect different clusters in a network and help distribute novel information (Granovetter, 1973), whereas stronger ties typically provide access to substantive forms of capital, such as social support. Using this distinction, we examine how Facebook network characteristics (the number of total Facebook friends, the number of perceived "actual" friends on the site, and the ratio of "actual" to total friends) and forms of Facebook use (frequency of Facebook visits and likelihood of engaging in SMRMB) associate with access to two types of social benefits, namely, perception of support and useful information.

As Facebook's technical and social features generally enable users to connect and interact with their connections on the site, prior work focusing on younger age groups has documented positive relationships between social capital and various Facebook activities, including total Facebook friends, perceived actual friends on the site (Ellison et al., 2011), the ratio of actual to total friends (Chang et al., 2015), and relationship maintenance behaviors (Ellison et al., 2014). However, when comparing the various Facebook activities, some activities are more predictive of social benefits than others. Ellison et al. (2011) found that the number of "actual" friends was significantly associated with increased levels of both bonding and bridging social capital, while the number of total friends was not. Similarly, a recent study employing a representative adult sample found that the proportion of "actual" to total friends was negatively related to loneliness (Chang et al., 2015). These results suggest that the number and the proportion of more meaningful connections (i.e., those perceived to be "actual" friends) in a Facebook network, as opposed to the number of all connections in a network, are more predictive of access to social benefits.

In addition to network characteristics, Ellison et al. (2014) demonstrate that likelihood of engaging in relationship maintenance behaviors on Facebook (e.g., commenting on friends' posts) is associated with increased perceptions of bridging social capital, suggesting that more meaningful social practices, as opposed to generic Facebook use, are more likely to facilitate access to the social benefits associated with one's Facebook network. Integrating results from previous studies, we expect that the number of actual friends, the ratio of actual to total friends, and SMRMB are all positively associated with perceived support and access to useful information on social media among older Facebook users. As previous research primarily focuses on younger or general populations, we extend extant research by focusing on older adults. Thus, we suggest:

H_2: Among older Facebook users, (a) the number of actual friends on Facebook, (b) the ratio of actual to total friends, and (c) SMRMB are all positively associated with users' perceived support.

H_3: Among older Facebook users, (a) the number of actual friends on Facebook, (b) the ratio of actual to total friends, and (c) SMRMB are all positively associated with users' perceived access to useful information.

Methods

Sample

This study employs telephone survey data from the Pew Internet and American Life Project, including a nationally representative sample of 2,003 adults, aged 18 and older, who were residents of the continental United States. A random digit dialing approach that included landline (1,002) and cell phone numbers (1,001) was used. Interviews were conducted in English and Spanish between September 11 to 14, 2014 and September 18 to 21, 2014. The median age (Mdn = 40; M = 46.43; SD = 17.55) of the total sample was older than the median age of the U.S. population (Mdn = 37.7; U.S. Census Bureau, 2014) because only those who were 18 years old or older were included in the study. Other basic demographics, including gender (Female = 50.82%) and race/ethnicity (non-Hispanic White = 66.47%), of the total sample, are reasonably comparable to the U.S. population (Female = 50.8%; non-Hispanic White = 62.1%; U.S. Census Bureau, 2014).

Because this study focuses on older adults' Facebook use, we only included Facebook users (those who reported using Facebook, N = 1,138) in the analyses. The sample sizes for analyses of Facebook use differences and social benefits associated with Facebook use were different. The full sample of Facebook users (N = 1,138) was used to investigate how Facebook use patterns differ by age groups. Of these 1,138 respondents, the 98 who were over 65 comprised the sample for analyzing social benefits associated with Facebook use among older adults.

Measures

Facebook Network Characteristics. Following Ellison et al. (2011), participants' total number of Facebook friends was measured in an open-ended question: "Approximately how many total Facebook friends do you have?" (M = 342.19; SD = 566.55). In addition, to assess number of actual friends on Facebook, we included the item employed by Ellison et al. (2011): "Approximately how many of your TOTAL Facebook friends do you consider actual friends?" (M = 116.28; SD = 300.07). These two measures were used to compute the ratio between actual and total friends (M = .46; SD = .36).

Frequency of Facebook Visits. The question about frequency of Facebook visits was framed as: "About how often do you visit or use Facebook?" (M = 3.97; SD = 1.20). The responses ranged from 1 (*less than every few weeks*) to 5 (*several times a day*).

Social Media Relationship Maintenance Behaviors. The three items used to capture SMRMB were adapted from Ellison et al. (2014): "When you see a friend or acquaintance sharing good news on social media, you try to respond," "When you see a friend or acquaintance sharing bad news on social media, you try to respond," and "When you see someone asking a question on social media that you know the answer to, you try to respond." Together, these measures speak to a self-perception users hold about how they use social media for active engagement. The response options ranged from 1 (*strongly disagree*) to 4 (*strongly agree*). A composite measure of SMRMB was created by summing the three items, with higher scores representing higher likelihood of engaging in SMRMB (M = 8.85; SD = 2.33; α = .74).

Social Benefits. Consistent with the theoretical framework of bonding and bridging social capital (Putnam, 2001), we assessed two types of social benefits—perceived support and access to useful information. On a 4-point Likert scale (1 = *strongly disagree*; 4 = *strongly agree*), our measure of perceived support was: "You get support from friends on social media" (M = 3.02; SD = .95). To capture access to useful information, respondents were asked to report the extent to which they agreed that they got useful information from social media (M = 3.00; SD = .87).

Web-Use Skills. Our measure of Web-use skills was adapted from Hargittai and Hsieh (2012). This measure was included as a control variable in this study because prior work shows that Web-use skills relate to diversity of Internet use (Hargittai, 2010). On a 5-point Likert scale (1 = *no understanding*; 5 = *full understanding*), respondents were asked to report their familiarity with six Web-related terms: advanced search, PDF, spyware, wiki, cookies, and hashtag. A composite measure of Web-use skills was created by summing scores to the six terms, with higher scores signifying better Web-use skills (M = 19.77; SD = 7.26; α = .89).

Demographics. Demographic measures of Facebook users used for the analyses were age (M = 40.92; SD = 15.80), gender (Female = 55.16%), race/ethnicity (non-Hispanic White = 67.04%), education (*Mdn* = some college), income (*Mdn* = $40,000 to under $50.000), employment status (employed = 62.06%), and cohabitation (cohabited = 82.08%).

Zero-order correlations among all predictors for Facebook users are reported in Table 1. Descriptive statistics of all predictors for the full sample of Facebook users and by age groups are summarized in Table 2.

Table 1
Zero-Order Correlations among All Predictors for Facebook Users

	1	2	3	4	5	6	7	8	9	10	11	12
1 Age												
2 Female	$.06^a$											
3 White	$.23^c$	.03										
4 Education	$.14^c$	−.01	$.13^c$									
5 Income	$.17^c$	$−.08^b$	$.25^c$	$.39^c$								
6 Employment status	$−.22^c$	$−.13^c$	.05	$.18^c$	$.21^c$							
7 Cohabitation	$−.08^b$	.00	$.08^b$	.02	$.23^c$	.06						
8 Web-use skills	$−.25^c$	$−.09^b$	$.13^c$	$.30^c$	$.31^c$	$.21^c$	$.13^c$					
9 Total friends (log)	$−.43^c$	.05	−.02	.00	.01	$.13^c$	$.12^c$	$.28^c$				
10 Actual friends (log)	$−.22^c$	.06	$.10^b$	.05	$.12^c$	$.10^b$	$.15^c$	$.26^c$	$.61^c$			
11 Ratio of actual to total friends	$.25^c$	.00	$.13^c$	.03	$.09^b$	−.04	.05	−.04	$−.39^c$	$.41^c$		
12 Frequency of visits	$−.16^c$	$.09^b$	.03	−.04	.01	$.07^a$	$.10^b$	$.12^c$	$.30^c$	$.29^c$	−.03	
13 SMRMB	−.03	$.17^c$	.04	−.03	−.05	$−.07^a$	.01	$.09^b$	$.22^c$	$.27^c$	.05	$.34^c$

Note. Baseline $N = 1{,}138$. Cell entries are Pearson's R correlation coefficients. Variables number 2, 3, 6, and 7 are dichotomous and Pearson's point-biserial correlations are used. $^a p < .05$, $^b p < .01$, $^c p < .001$

Table 2
Descriptive Statistics of All Predictors for Facebook Users

	All		18–65		65+		t or χ^2
	M or %	SD	M or %	SD	M or %	SD	
Age (18–89)	40.92	15.80	38.10	13.36	70.79	5.41	47.67***
Non-Hispanic White (0–1)	67.04	-	64.55	-	90.71	-	27.46***
Female (0–1)	55.16	-	54.63	-	60.74	-	1.58
Education (1–8)	4.62	1.79	4.58	1.77	4.85	1.91	1.42
Income (1–9)	5.06	2.52	5.02	2.56	5.36	2.08	1.37
Web-use skills (6–30)	19.77	7.26	20.17	7.19	15.70	6.61	5.77***
Employed (0–1)	62.06	-	66.57	-	18.30	-	6.77***
Cohabited (0–1)	82.08	-	82.84	-	73.77	-	5.30*
Total friends	342.19	566.55	363.76	576.15	113.89	304.30	2.94**
Actual friends	116.28	300.07	121.11	306.65	57.97	184.37	5.23***
Ratio of actual to total friends (0–1)	0.46	0.36	0.44	0.35	0.65	0.35	5.20***
Frequency of visits (1–5)	3.97	1.20	4.02	1.19	3.60	1.18	3.34**
SMRMB (3–12)	8.85	2.33	8.93	2.30	8.04	2.62	3.12**
Baseline N	1138		1040		98		

Note. Reported means and percentages are weighted. Comparisons made between younger and older age groups, between means (t-test) and percentages (χ^2 test). *$p < .05$, **$p < .01$, ***$p < .001$.

Analytic Procedures

We first used univariate analysis to get a basic understanding of Facebook use differences across younger (18–65) and older age groups (65+). However, because demographic factors (e.g., income) may influence age-group differences in Facebook use and different Facebook activities are inter-related, it is essential to control the influence of demographics, Web-use skills, and other related Facebook activities (e.g., network characteristics) to understand how age groups differ vis-à-vis one particular Facebook activity (Facebook visits, for instance) above and beyond the influence of possible confounding variables. Thus, we used binary logistic regression to examine how different Facebook activities predict whether a Facebook member is above or below the age of 65, while including other demographics and Web-use skills as covariates. Furthermore, we performed ordered logistic regression to examine how different Facebook activities are associated with perceived support and access to useful information among older adults because the two outcome variables were in ordinal measurements.

Results

First, we explore differences in Facebook usage between younger and older users (H_1, RQ_1, and RQ_2). Univariate analysis (Table 2) shows that older users have a smaller number of total and "actual" friends, have a higher proportion of actual to total friends, visit Facebook less frequently, and are less likely to engage in SMRMB than younger users. We use logistic regression analysis to better understand how each Facebook activity is stratified by age group above and beyond the influence of other possible confounding variables. In the binary logistic regression model predicting the likelihood of being in the older age group (Table 3), we include actual friends and the ratio of actual to total friends, because prior work suggests that actual friends (Ellison et al., 2011) and the ratio of actual to total friends (Chang et al., 2015) are more predictive of access to social benefits than total friends. To avoid effects from outliners, a log transformed actual friends measure ($M = 1.63$; $SD = .63$; Skewness reduces from 10.31 to -.16; Kurtosis reduces from 141.35 to .12) is used for regression analyses. We first assess how demographics and Web-use skills differ by age groups. As Table 3 shows, those who are non-Hispanic White, unemployed, have higher income, higher education, and lower Web-use skills are more likely to be in the older age group. With regard to Facebook activities, results show that those who have fewer "actual" friends and a higher ratio of "actual" to total friends are more likely to be in the older age group. Overall, findings suggest that older users have fewer total and "actual" friends and a higher proportion of "actual" to total friends than younger users, while frequency of Facebook visits and SMRMB are not statistically different across the two age groups. H_{1a} and H_{1b} are thus supported.

Next, we examine the associations between Facebook usage patterns and social benefits with a focus on the older population (H_2 and H_3). We predict that number of

Table 3
Binary Logistic Regression: Predicting Differences in Facebook Use between Younger (18–65) and Older Users (65+)

	b(se)	exp(b)
Female	−.06(.31)	.94
Non-Hispanic White	1.94(.47)	6.96***
Education	.25(.10)	1.29**
Income	.16(.07)	1.17*
Employed	−2.47(.36)	.09***
Cohabited	−.26(.38)	.77
Web-use skills	−.08(.02)	.92**
Actual friends (log)	−.78(.32)	.46*
Ratio of actual to total friends	1.58(.45)	4.86***
Frequency of visits	.03(.14)	1.03
SMRMB	−.11(.07)	.90
Constant	−2.11(.87)	.12*
Nagelkerke R^2	.37	

Note. N = 805. *p < .05, **p < .01, ***p < .001.

"actual" friends (H_{2a}), the ratio of "actual" to total friends (H_{2b}), and SMRMB (H_{2c}) would be positively associated with perceived support. In the ordered logistic regression predicting perceived support (Table 4), frequency of visits is a positive predictor in Model 1. We added the ratio of actual to total friends to Model 2, but frequency of visits remain the only positive predictor. When the number of "actual" friends is added to Model 3, only "actual" friends is positively associated with perceived support. Finally, SMRMB is added to Model 4; both actual friends and SMRMB are positive predictors. Thus, H_{2a} and H_{2c} are supported, while H_{2b} is rejected.

Regarding another type of social benefit, access to useful information, we hypothesize that access to such benefits is positively associated with the number of "actual" friends (H_{3a}), the ratio of "actual" to total friends (H_{3b}), and SMRMB (H_{3c}). In the ordered logistic regression predicting perceived access to useful information (Table 5), frequency of visits is a consistent significant predictor in Models 1 to 3, while the ratio of actual to total friends and actual friends are not significant predictors in Models 2 and/or 3. In Model 4, only SMRMB is significantly associated with increased perception of access to useful information. Thus, H_{3c} is supported while H_{3a} and H_{3b} are rejected.

Discussion

Using a national sample, this study examines Facebook use and its associated social benefits among Americans aged 65 or older, a population that is increasing in size and is rapidly adopting SNSs. The findings advance an understanding of older adults'

Table 4
Ordered Logistic Regression: Predicting Perceived Support among Older Facebook Users (65+)

	Model 1		Model 2		Model 3		Model 4	
	b(se)	exp(b)	b(se)	exp(b)	b(se)	exp(b)	b(se)	exp(b)
Age	.02(.05)	1.02	.02(.05)	1.02	.02(.05)	1.02	.03(.05)	1.03
Female	.26(.48)	1.29	.07(.50)	1.08	-.07(.51)	.93	-.13(.53)	.88
Non-Hispanic White	-.12(.80)	.89	-.31(.86)	.74	-.45(.88)	.64	-.55(.89)	.58
Education	-.01(.13)	.99	-.01(.14)	.99	.00(.14)	1.00	.02(.14)	1.02
Income	-.24(.15)	.79	-.23(.15)	.80	-.25(.16)	.78	-.22(.16)	.80
Employed	.01(.58)	1.01	.10(.61)	1.11	-.18(.62)	.84	.02(.64)	1.02
Cohabited	.77(.58)	2.17	.80(.59)	2.23	.71(.60)	2.02	.65(.62)	1.91
Web-use skills	.04(.04)	1.04	.04(.04)	1.04	.01(.04)	1.01	.00(.05)	1.00
Frequency of visits	.55(.20)	1.72**	.51(.21)	1.67*	.38(.22)	1.47	.22(.24)	1.25
Ratio of actual to total friends			.76(.72)	2.14	.22(.78)	1.24	.33(.81)	1.39
Actual friends (log)					1.25(.59)	3.50*	1.17(.59)	3.23*
SMRMB							.24(.11)	1.28*
Nagelkerke R^2	.17		.16		.22		.28	
N	73		68		68		65	

Note. $*p < .05$, $**p < .01$.

Table 5
Ordered Logistic Regression: Predicting Perceived Access to Useful Information among Older Facebook Users (65+)

	Model 1		Model 2		Model 3		Model 4	
	b(se)	exp(b)	b(se)	exp(b)	b(se)	exp(b)	b(se)	exp(b)
Age	−.02(.05)	.98	−.01(.05)	.99	−.01(.05)	.99	−.02(.05)	.98
Female	.10(.48)	1.11	.44(.51)	1.56	.40(.52)	1.49	.17(.55)	1.18
Non-Hispanic White	−.59(.79)	.56	−.42(.86)	.66	−.41(.86)	.66	−.76(.90)	.47
Education	−.04(.13)	.96	−.03(.14)	.97	−.03(.14)	.97	−.04(.15)	.96
Income	−.35*(.15)	.70	−.31(.16)	.74	−.31(.16)	.74	−.29(.17)	.75
Employed	.41(.58)	1.51	.22(.62)	1.25	.18(.62)	1.20	.28(.66)	1.33
Cohabited	.30(.59)	1.35	.31(.61)	1.36	.27(.61)	1.31	.05(.64)	1.05
Web-use skills	.08(.04)	1.08	.07(.04)	1.07	.06(.04)	1.07	.03(.05)	1.03
Frequency of visits	.69(.21)	2.00**	.73(.22)	2.08**	.69(.24)	1.99**	.48(.25)	1.61
Ratio of actual to total friends			−.93(.74)	.40	−1.10(.79)	.33	−1.10(.82)	.33
Actual friends (log)					.33(.55)	1.39	.12(.58)	1.13
SMRMB							.40(.12)	1.49**
Nagelkerke R^2	.28		.31		.31		.44	
N	76		70		70		68	

Note. *p < .05, **p < .01.

Facebook use and its associated social benefits, which can inform future technological interventions to help older adults better access social benefits via SNS platforms.

First, the examination of differences in Facebook use across younger and older age groups reveals unique Facebook usage patterns among older adults. Regarding Facebook network characteristics, we find that older users have a smaller number of total friends and a higher ratio of actual to total friends, compared to those under the age of 65. The gerontology literature suggests that there are two explanations for these differences. One possible explanation is that older users are more likely to miss opportunities to expand their Facebook network size due to involuntary reasons, such as mandatory retirement, than younger users (e.g., Antonucci & Akiyama, 1987). Another possibility is that older adults may deliberately keep a smaller number of Facebook connections as they increasingly focus only on stronger ties that are more emotionally rewarding (e.g., Carstensen, 1993). Moreover, our analysis further shows that older users consider fewer "actual" friends on Facebook, com-pared to younger users. Importantly, as prior work shows that self-reported "actual" friends are more likely to provide social benefits, compared to any connections on the site (Ellison et al., 2011, 2014), this pattern of findings suggests that the smaller, stronger-tie networks among older users may limit their ability to acquire related social benefits.

With regard to forms of Facebook use, interestingly, while it is widely recognized that older adults' Internet use tends to be restricted by their limited physical ability (e.g., cognitive declines) (Czaja et al., 2010) and negative attitudes (e.g., privacy concerns) (Xie et al., 2012), our findings show that neither frequency of visits nor engagement in SMRMB significantly differ by age groups above and beyond the influence of demographics, Web-use skills, and other related Facebook activities. As prior work suggests that older adults' SNS adoption is primarily driven by the need to connect with family and close friends (Goode, 2011), it is possible that because older adults' Facebook networks consist of a higher proportion of "actual" friends, they may be more motivated to use the site and engage in SMRMB to maintain these relationships, offsetting their privacy concerns and any technical difficulties they might experience. Overall, our results suggest that older adults' Facebook network seems to mirror their offline ones—that is, older users' Facebook networks are smaller and narrower, with a higher ratio of "actual" to total friends, compared to younger users. Such network structures may motivate older adults to use the site and maintain these relationships as actively as do their younger counterparts.

Second, findings regarding the relationships between older adults' Facebook use and social benefits highlight the specific Facebook practices that are more beneficial to the older population. As expected, we found that SMRMB is positively associated with access to useful information. It is possible that because SMRMB, such as commenting on friends' posts, has the potential to be seen by all members of the recipient's network (not just one's own network, as are reached by a status update), engagement in SMRMB may increase the likelihood of interacting with friends of friends and possibility of accessing useful information from these weak ties. These

findings are consistent with prior work on FRMB and bridging social capital among younger age groups (e.g., Ellison et al., 2014). Moreover, our study extends prior work on FRMB by examining how SMRMB as well as other Facebook practices are associated with the social benefits linked to bonding ties, namely perceived support. Results show that SMRMB and the number of "actual" friends on the site positively predict users' perceived support, while the ratio of "actual" to total friends and frequency of visits are not significant predictors. It may be that the number of quality connections increases the likelihood of receiving meaningful support and that engagement in SMRMB can cultivate social relationships, which, in turn, increases the likelihood of receiving support.

Collectively, we found that older Facebook users' networks consist of fewer total and "actual" friends, and a higher ratio of "actual" to total friends than younger users. Interestingly, although substantial research shows that older adults have more barriers to Internet and SNS use, such as cognitive declines (Czaja et al., 2010) and privacy concerns (Xie et al., 2012), our results show that older adults' Facebook practices, including frequency of visit and likelihood of engagement in SMRMB, do not significantly differ from their younger counterparts. These Facebook practices may be motivated by the higher proportion of "actual" friends in their networks. Furthermore, consistent with prior research on younger age groups (e.g., Ellison et al., 2014), our findings show that older users' access to types of social benefits is not conferred simply by the existence of any connections on Facebook or being on the site. Instead, access to social benefits may depend on the number of quality connections and users' level of engagement in relationship maintenance behaviors such as responding to requests for help.

Limitations and Implications for Future Technological Interventions

This study has some limitations that future work should address. Given the cross-sectional research design, the directionality of the observed relationships is unclear. Further, single-item measures of social support and access to useful information should be replaced with multi-item scales in future work. Finally, future efforts should conduct qualitative research such as interviews with seniors to better describe how and why older adults are and are not using SNSs. Despite these limitations, our findings suggest two important implications for technological interventions that aim to use Facebook or other related platforms to help older adults better access social benefits.

First, as our results show that older users have fewer "actual" friends—connections that may be likely to be stronger offline connections (Ellison et al., 2011)—than younger users and that the number of "actual" friends is associated with increased levels of perceived support among older users, it is important to help older adults expand their quality connections on SNS platforms. When designing technological interventions, scholars have become increasingly aware of older adults' need to communicate with family members. For example, Lindley (2012) proposes lightweight messaging systems that facilitate communication between older adults and their children and grandchildren in particular. However, our results suggest that older adults may perceive more support

via SNS platforms if the interventions can help them to connect not only to family members but also to stronger offline connections. Indeed, prior work shows that both kin and non-kin ties are important for older adults' well-being although they meet different interpersonal needs; kin ties provide substantive forms of support whereas non-kin ties are sources of enjoyment and feelings of autonomy (Larson, Mannell, & Zuzanek, 1986). The technological features supported by SNSs may be well-suited for enhancing older adults' ability to receive social benefits associated with non-kin relations. For example, interviewing middle-aged and older SNS users, Quinn (2013) found that SNSs' technical and social options, such as search features, recommendation algorithms, and visibility of friends' networks, often help these users reconnect with dormant ties or old friends with whom they have lost touch, such as former classmates and colleagues. Likewise, a recent study shows that SNS use is associated with increased feelings of connectedness to a network of friends and the contribution of SNS use to such feelings increases as people become older (Yu et al., 2015). As there is evidence that older adults often develop new social connections (often weak ties) to compensate for the loss of ties due to life transitions, such as retirement and widowhood (Cornwell & Laumann, 2015), SNS use may play an increasingly important role in assisting older adults to cultivate dormant ties as they adapt to the later-life challenges. Thus, rather than solely focusing on the connections with family members, technological interventions may help older adults better connect with quality contacts.

Second, as findings show that SMRMB is associated with increased access to perceived support and useful information, it is important that technological interventions incorporate interaction features and encourage older adults to engage in relationship maintenance behaviors. For example, when Cornejo et al. (2013) redesigned a digital display showing photos from an older adult's family network, altering it from a one-way (i.e., exposing older adults to family updates) to a two-way communication system (i.e., older adults could send feedback), the change strengthened the relationships between the older participants and their weaker ties that were more difficult to meet in person. Brandtzæg (2012) also demonstrated the positive implications of engagement in interactive behaviors on SNSs in a longitudinal study. In particular, he found that *socializers*, those who frequently engage in socializing activities with SNS connections, perceive higher levels of bridging social capital than *lurkers*, those who mainly engage in consumptive behaviors, such as looking at photos and finding information about friends. As SNS's technological features, such as commenting or clicking on the "like" button, allow users to respond to another user easily and explicitly, lowering the cost of maintaining relationships with multiple others, it is essential to encourage older adults to engage in relationship maintenance activities to increase their access to social benefits.

Conclusion

This study uses a nationally representative sample to investigate Facebook use in the older population—an important component of the U.S. population with growing rates of SNS adoption. Results of the study show that older users' Facebook networks are

smaller and narrower than those of younger users, which seems to mirror their offline network structures (Antonucci & Akiyama, 1987; Carstensen, 1993). Further, despite the research evidence that shows that older adults have more barriers to SNS use than younger adults, such as cognitive declines (Czaja et al., 2010) and privacy concerns (Xie et al., 2012), we found that older adults visit the site and engage in SMRMB as frequently as their younger counterparts. It may be that the higher proportion of "actual" friends who are likely to be stronger connections in their networks (Ellison et al., 2011) motivates older adults to visit the site and engage in SMRMB as actively as do their younger counterparts. Further analysis suggests that, as opposed to simply being online or connecting to any social tie, engagement in relationship maintenance behaviors and connection with those considered "actual" friends are more beneficial for older adults' access to social benefits. Together, these findings suggest that technological interventions could help older adults connect to more stronger contacts, and engage in relationship maintenance behaviors more frequently. In doing so, innovative technological interventions may help make older adults' SNS activities more productive, allowing them to use these platforms to acquire support and useful information. Thus, our findings highlight important directions for technological interventions meant to ensure the social benefits associated with SNS use are equally available to older adults as well as the younger demographics that are the focus of most of the marketing attention and academic research.

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