Technology and Retirement Life: A Systematic Review of the Literature on Older Adults and Social Media

Bo Xie, Man Huang, and Ivan Watkins

Abstract
The increasingly ubiquitous adoption of technology in contemporary society brings both opportunities and challenges for older adults in retirement. This chapter examines how one specific type of technology, social media, can assist older adults in living a happy and productive life, helping them to cope with retirement transition and the challenges that older adults face in a technology-oriented world. A systematic review of the literature of twenty-nine databases in eight fields was conducted in September–November 2010 to identify existing research on older adults and social media. After four rounds of careful screening, ten articles were selected from these databases. Combined with two additional articles obtained through professional contacts, a total of twelve articles reporting fifteen independent studies was included in the final sample for qualitative analysis. While these existing studies are small in sample size and exploratory in nature, they shed light on the intersection of older adults and social media. Key themes identified in these articles are discussed and future research directions are proposed.

Key Words: social media, Web 2.0, social networking, information and communication technology, aging

Technology is increasingly ubiquitous in contemporary society. This ubiquity brings both opportunities and challenges for older adults in retirement. For instance, with the development of information and communication technologies (ICTs), it is now possible to access vast amounts of high-quality, up-to-date information about health, social security, taxes, and local communities via computers, and communicate and interact with family and friends far away or make new friends around the world with relatively low cost (Xie, 2003). However, to take full advantage of new ICTs, one needs to have sufficient knowledge and skill about these technologies. Older adults’ adoption of new technology traditionally lags behind that of younger people. For instance, while the older population’s adoption of e-mail is catching up with the adoption rate of other age groups (Jones & Fox, 2009), older adults’ adoption of newer web applications such as social media still lags behind (Lenhart, 2009).

What are older adults’ perceptions and uses of newer internet applications like social media? Answers to this question can help develop a better understanding of the impact of social media on older adults, providing a lens to recognize the opportunities and challenges in retirement associated with new technology. Toward this end, we conducted a systematic review of the literature to identify the themes in peer-reviewed articles that address older adults’ use of social media. We focus on social media instead of technology in general for two main reasons: first, the impact of technology in general on older adults has previously been examined (Charness & Schaie, 2003), and second,
social media is a new domain that has just begun to emerge during the past few years. This new domain has great potential and requires more systematic examination.

Below, we will first review the brief history of social media to establish an understanding of what social media are and what opportunities—and challenges—they might bring to individuals and society. We then report the procedure and results of our systematic literature review on older adults and social media, followed by the discussion and future research directions.

**Literature Review**

Social media support user participation, peer-to-peer interaction, information sharing and collaboration, community building, and development (Meraz, 2009; O’Reilly, 2004). While traditional forms of mass media like radio, newspaper, and television feature asymmetric information dissemination and control between the broadcaster and the public, social media are “many-to-many media” that “now make it possible for every person connected to the network to broadcast as well as receive text, images, audio, video, software, data, discussions, transactions, computations, tags, or links to and from every other person” (Rheingold, 2008, p. 100).

The emergence of social media is an inherently dynamic phenomenon, characterized by rapid development and frequent technological and behavioral changes (Hogan & Quan-Haase, 2010). Social media websites typically evolve over time in response to their users’ needs and preferences (Hogan & Quan-Haase, 2010). Describing the history of social media is no easy task: The scope of social media can hardly be specified, and no commonly accepted definition of social media precisely describes the types of communication, interaction, and services that social media comprise. Kaplan and Haenlein (2010) define social media as “a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of User Generated Content” (p. 61). However, the fuzzy boundary between social media and related concepts (e.g., Web 2.0, user-generated content) makes it challenging to define exactly what social media are or when they began to be distinguishable from precedent technologies (Hogan & Quan-Haase, 2010).

Despite the definitional difficulties, different forms of social media do share certain characteristics. In particular, all social media rely on computer-mediated communication (CMC) as a platform, and the history of social media is closely in line with that of CMC. Until the late 1990s, CMC was primarily text-based (Herring, 2004); web pages displayed few of the dynamic characteristics associated with contemporary social media websites (Ha & James, 1998). Users needed a mailer system to access e-mail; similarly, a newsreader was necessary to access Usenet newsgroups (Herring, 2004). Despite the “crude and fragmented” nature of CMC at that time (Herring, 2004, p. 27), these services, along with listservs, became especially popular on college campuses (e.g., in 1979, students from Duke University created Usenet as the first online discussion platform; Kaplan & Haenlein, 2010). Between 2000 and 2005, CMC migrated to web browsers, corresponding with the increasing availability in broadband/high-speed internet. Synchronous chat (instant messaging) and web-accessible e-mail gained popularity during this period. With the wide adoption of ICTs among the general public, CMC is no longer a privilege among the technologically more experienced professionals (Herring, 2004).

In 2004, the concept of “Web 2.0” emerged from the industry (O’Reilly, 2004). Web 2.0 is frequently associated with social media, and oftentimes the phrases are used interchangeably (O’Reilly, 2004). Similar to social media, no commonly accepted definition for the Web 2.0 concept exists. Rather, Web 2.0 is best understood in contrast with Web 1.0. Compared with Web 1.0, Web 2.0 “offers more interactivity, faster feedback, pageless designs, in-context controls, personalization, and access to social networks” (Chadwick-Dias, Bergel, & Tullis, 2007, p. 868). Core Web 2.0 components include the following: First, Web 2.0 serves as a “platform” for broad user participation, in contrast to Web 1.0 as a passive information source (O’Reilly, 2004). Second, user initiative and participation on Web 2.0 sites involve content generation (i.e., user-generated content such as profile pages, user review, status updates) and social networking (e.g., searching for “friends” on the web, recommending “friends”), made possible through numerous technological applications (Cormode & Krishnamurthy, 2008). Third, the versatility of the technologies and subsequent social practices is another key component of Web 2.0. Diverse and fast-changing Web 2.0 techniques provide users with “new ways of using the Internet that are quickly developing into new social practices and new forms of knowledge exchange” (Song, 2010, p. 250).

Since 2005, there has been an enormous rise in the popularity of social networking sites (SNSs). By
September 2009, nearly half of U.S. adult internet users used SNSS (Lenhart, 2009). This number is even higher with younger people: While 55% of teenagers used SNSS in 2006, this number reached 65% in 2008 and 73% in 2009; 75% of internet users age 18–24 maintain a profile on an SNS (Lenhart, Purcell, Smith, & Zickuhr, 2010). Nearly one-third of adult internet users in the United States contributed self-generated content online in 2009, up from 21% in 2007 (Lenhart, 2009). Video sharing sites (e.g., YouTube) are becoming almost ubiquitous with younger people, with 89% of internet users between the ages of 18 and 29 using such sites (Madden, 2009). Facebook stands out as one of the most popular SNSs among high school and college students (Ellison, Steinfield, & Lampe, 2007).

Although new technologies typically offer significant benefits for improving the independence and quality of life for older adults, educational, cognitive, physiological, and experiential factors present challenges to older adults’ use of technology (Charness & Schaie, 2003). Age-related differences to information-processing capabilities may impair older adults’ relationship with the complicated contemporary technological environment (Schieber, 2003). Previous life experiences may have left older adults unprepared for contemporary technology (Charness & Schaie, 2003). Despite these challenges, advancements in communication technology and technology integrated into the living environment offer numerous benefits to older adults by easing transportation demands and physical limitations, and creating an online network of social contacts (Charness & Schaie, 2003).

Table 31.1 below illustrates key features of three prominent social media applications: (1) Facebook,

<table>
<thead>
<tr>
<th>Site</th>
<th>Social Networking Feature</th>
<th>Multimedia Functionality</th>
<th>Personalization Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facebook</td>
<td>• Users can establish a network of connections with other users—all called “friends.”</td>
<td>• Facebook allows users to upload digital photographs &amp; share media from other internet platforms (e.g., video).</td>
<td>• Facebook allows users to choose a picture that is prominently displayed when someone visits their profile.</td>
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<tr>
<td></td>
<td>• Users indicate their interests on their profile. If “friends” share an interest, Facebook will highlight the shared interest.</td>
<td>• Facebook serves as a platform for interactive games (e.g. Farmville).</td>
<td>• Facebook users can indicate their interest in different things (&quot;likes&quot;).</td>
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<tr>
<td></td>
<td>• Users can form groups based on shared interests.</td>
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<td></td>
<td>• Via interactive calendar (called “events”), “friends” can respond to these “events.”</td>
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<td></td>
<td>• Users can interact privately via instant messaging (chat), e-mail, or “poking.” Users can also leave public messages on another user's profile that will be publicly displayed (i.e., posting on another user's &quot;wall&quot;)</td>
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<tr>
<td></td>
<td>• Users can upload digital photographs &amp; share media from other internet platforms (e.g., video).</td>
<td>• Users can create “tags” (descriptive keywords) for the video they upload.</td>
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<tr>
<td></td>
<td>• Users can indicate their interest in different things (“likes”).</td>
<td>• Facebook serves as a platform for interactive games (e.g. Farmville).</td>
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<td></td>
<td>• Facebook itself does not support multimedia; however, users can post links in their messages to other forms of media available on the web (e.g., YouTube videos).</td>
<td>• Users can choose an icon that displays on other users' profiles to represent themselves. Users can customize their profiles by changing the background or theme of their Twitter page.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Site</th>
<th>Social Networking Feature</th>
<th>Multimedia Functionality</th>
<th>Personalization Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>YouTube</td>
<td>• User profiles are called “channels.” Users can “subscribe” to channels. Subscribers are notified when a channel uploads new video content.</td>
<td>• Users can upload video onto the site.</td>
<td>• Users can customize their “channel.”</td>
</tr>
<tr>
<td></td>
<td>• Users can establish a social network of “friends” through Google friends.</td>
<td>• Users can create “tags” (descriptive keywords) for the video they upload.</td>
<td>• Users can create a list of their favorite videos, along with creating playlists of videos.</td>
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<td></td>
<td>• Users can post text comments for each video.</td>
<td></td>
<td>• Users can rate videos that they have viewed.</td>
</tr>
<tr>
<td>Twitter</td>
<td>• Users establish connections by “following” other users, which means that users will receive the messages (“tweets”) posted by the users they follow.</td>
<td></td>
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<tr>
<td></td>
<td>• Users can post messages or “tweets” of up to 140 characters. When a user posts a “tweet,” the message appears on that user’s profile.</td>
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</table>
an SNS; (2) YouTube, a video sharing site; and (3) Twitter, a micro-blogging site.

Social Media Use: Opportunities and Challenges

As a reflection of the dramatic development and wide adoption of social media applications in contemporary society, during the past few years there have been a large—and rapidly growing—number of studies on the impact of social media on individuals and society. There is evidence that online social networks are significantly larger than offline social networks (Acar, 2008). It is suggested that social media can create a wide range of opportunities for individual users, communities, and society at large, including:

• providing emotional support and developing and maintaining social relationships (Baym & Ledbetter, 2009; Greenhow & Robelia, 2009)
• facilitating integration and socialization into a community (Halavais, 2009)
• promoting information sharing and learning (de Almeida Soares, 2008; Greenhow & Robelia, 2009; Paus-Hasebrink, et al., 2010; Luckin et al., 2009; Selwyn, 2009) and knowledge creation (Jones, 2008) among individuals
• facilitating self-expression, self-presentation, and identity construction (Livingstone, 2008; Rettberg, 2009)
• developing social capital (Sargent, 2009), including generating social capital for people with low self-esteem (Steinfield, Ellison & Lampe, 2008)
• promoting civic and political participation (Langlois, 2009; Smith, Schlozman, Verba, & Brady, 2009)
• improving the ability of government to provide efficient information services to citizens (Chun & Warner, 2010); e.g., facilitating the communication and dissemination of health information to the public (Chou, Hunt, Beckjord, Moser, & Hesse, 2009)
• affecting business models, marketing strategies and public relations, by, for instance, facilitating organizations of varying sizes to provide more efficient, timely, inexpensive, and direct customer services (Kaplan & Haenlein, 2010; Ong & Day, 2010; Foster, Fracescucci, & West, 2010; Isakson, 2010)

Social media also create challenges, particularly for privacy-related concerns. Research suggests that younger people disclose personal information in SNSs without sufficient awareness of the potential dangers associated with disclosure (Taraszow, 2010). Concern exists among educational professionals and parents that personal disclosures in SNSs facilitate sexual solicitation and cyberbullying (Brandtzæg, 2009), though this danger might be exaggerated (Holmes, 2009). Further, doubt exists about whether social media actually empower users if site developers still maintain significant control over users (Pauwels & Hellriegel, 2009). Zajicek (2007) questions whether Web 2.0 can truly facilitate participation and interaction across all social groups, arguing that the increasingly ubiquitous use of multimedia in Web 2.0/social media applications may exclude, for instance, visually impaired individuals.

Few studies have examined older adults’ interaction with social media. The majority of existing studies on older adults and internet applications focus on earlier forms of ICTs such as online forums or discussion groups (e.g., McCormack, 2010; Thomas, 2007; Mc Mellon & Schiffman, 2002; Nahm et al., 2009; Xie, 2006, 2008a, 2008b). A notable trend, though, is that older adults, while still largely lagging behind their younger counterparts, have begun to adopt newer applications such as blogs, Facebook, and Wikis. By September 2009, 7% of internet users in the United States age 65 or older had maintained a profile on an SNS (Lenhart, 2009). While this percentage is small compared with the 73% of the younger population, it nonetheless gives some ground for some to argue that SNSs have “matured” to the “age-neutral” stage where internet users regardless of age can all use these sites to meet daily needs (Stroud, 2008). It has been argued in the gerontology literature that SNSs are “not just for kids anymore” (Creamer, Stripling, & Heesacker, 2009, p. 280). Yet to date little is known about older adults’ perceptions of and experience with social media. The study described below aims to address this gap.

Method

Multiple rounds of procedures were performed during September–November 2010 to select relevant research articles for the sample.

Round 1: Database Selection

Databases available through the library of the University of Maryland, College Park were used to perform the search queries. Given the focus of this literature review, databases listed under eight fields most relevant to the topic under investigation—Anthropology, Communication, Computer Science, Education, Health and Medicine, Library Science,
Psychology, and Sociology—were selected to be the starting point for investigation. The following inclusion/exclusion criteria were used to select the 148 databases listed under these eight fields:

1. A database must contain journals that publish peer-reviewed research articles to be included; databases that contain only encyclopedia, doctoral dissertations or master theses, magazines, book reviews, news articles, or videos were excluded.
2. A database must allow searches within keywords, abstract, or full text to be included.
3. A database must provide English language coverage to be included.
4. A database must appear to be relevant to the subject under investigation to be included (e.g., the Geology database in the Anthropology category or databases in the Health and Medicine category that deal with basic and clinical medical research were deemed irrelevant and thus excluded).

This round of the selection resulted in a total of twenty-nine databases being selected (Table 31.2) from the databases listed under the eight fields; these twenty-nine databases were used for further examination.

**Round 2: Keyword Search**

During September to November, 2010, the following combination of keywords was used to search in the twenty-nine selected databases:

("social media" OR "social networking" OR "social computing" OR "Web 2.0" OR Facebook OR blog OR

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**Table 31.2 Databases Selected from the 148 Databases Listed in the Eight Selected Fields**

<table>
<thead>
<tr>
<th>Field</th>
<th>Database</th>
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<tbody>
<tr>
<td>Anthropology</td>
<td>1. Academic Search Premier</td>
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<td>2. Anthropology Literature</td>
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<td></td>
<td>3. AuthroSource</td>
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<td></td>
<td>4. Article First</td>
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<td></td>
<td>5. JSTOR</td>
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<tr>
<td>Communication</td>
<td>6. Communication &amp; Mass Media Complete</td>
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<td></td>
<td>7. PsycINFO</td>
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<td>Computer Science</td>
<td>8. Computer and Information Systems Abstracts</td>
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<td>9. Computer and Applied Science Complete (EBSCO)</td>
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<td>10. Computer Reviews</td>
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<td>11. IEEE Xplore</td>
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<td></td>
<td>12. Lecture Notes in Computer Science</td>
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<td></td>
<td>13. ScienceDirect</td>
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<td></td>
<td>14. Springer Online Journal Archive</td>
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<tr>
<td>Education</td>
<td>15. Education Research Complete</td>
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<tr>
<td>Health and Medicine</td>
<td>16. PubMed</td>
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<tr>
<td>Library Science</td>
<td>17. ACM Digital Library</td>
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<td>18. ERIC</td>
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<td></td>
<td>19. Library Literature and Information Science Full Text</td>
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<td>20. LISTA</td>
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<td></td>
<td>21. Social Sciences Citation Index—Web of Science</td>
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<tr>
<td>Psychology</td>
<td>22. PsycARTICLES</td>
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<td></td>
<td>23. Psychology &amp; Behavioral Science</td>
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<tr>
<td>Sociology</td>
<td>25. Contemporary Women’s Issues</td>
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<td></td>
<td>26. Family Studies Abstracts</td>
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<td></td>
<td>27. GenderWatch</td>
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<td></td>
<td>28. Ingenta ConnectComplete</td>
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<td></td>
<td>29. JSTOR Sociology</td>
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</table>
To obtain search results as inclusive as possible, no other search limit was used during this round of the selection. Due to differences in the twenty-nine selected databases, keywords contained in the above search query may appear in any field of an article, including the article title, abstract, or full text. This round of the selection resulted in a total of 3,025 articles from the twenty-nine selected databases.

Round 3: Screening the Titles and Abstracts

The title and abstract of each of the 3,025 articles were examined to determine whether both older adults and social media were within the scope of the article. Three inclusion/exclusion criteria were used in this round of the selection:

1. The concept of social networking must incorporate technological aspects on how social networking via computers and the internet may affect older adults’ social life. Articles that focus on social networking solely in an offline environment were excluded (e.g., Boneham & Sixsmith, 2006; Kondo et al., 2007; Russell, 2004).

2. The technological aspect studied in an article must be relevant to the core components of social media or Web 2.0 as discussed in the Literature Review section above (e.g., Cormode & Krishnamurthy, 2008; O’Reilly, 2004). If an article does not address the core components of social media or Web 2.0, it would be excluded. For example, an article that investigated game experience of older adults (Nacke, Nacke, & Lindley, 2009) was excluded because the gaming technology mentioned in the article did not embrace any component of social media or Web 2.0. Articles examining forum-based online communities that feature little social networking or user profiling were also excluded (e.g., Nimrod, 2010, 2011; Zaphiris & Sarwar, 2006).

3. While the focus of this literature review was on older adults’ use of social media, the authors had anticipated that the number of research articles on this topic would be small. To broaden the scope of the search, the authors decided that older adults need not be the only age group examined in a study. Articles that compare the usage of social media or Web 2.0 applications among younger and older users were thus included. One exception was the West, Lewis, and Currie (2009) article, which involved only younger adults as research participants. However, the explicit focus of the study was on “the extent to which older adults, especially parents, are accepted as Facebook friends, and the attitudes towards such friendships and potential friendships and what these reveal about notions of privacy” (p. 615). This article was included.

This round of the selection resulted in a total of eighty-eight articles that meet these criteria.

Round 4: Screening the Full Text

The full text of each of these eighty-eight articles was further examined to verify if each article indeed met the above three criteria used in Round 3 and to determine if each met the final criterion of reporting original, empirical research data. Articles examining the relationships between family or social relationships and basic internet use (e.g., e-mail), instead of social media or Web 2.0, were excluded (e.g., Hogeboom, McDermott, Perrin, & Osman, 2010; Sum, Mathews, Hughes, & Campbell, 2008; Sum, Mathews, Pourghasem, & Hughes, 2009). Articles that did not report original, empirical research data (e.g., meeting abstract, news report, book chapter, book review, magazine review article, or magazine cover story) were also excluded. One short conference proceedings paper reported the results of the same study as reported in a journal article. The conference proceedings paper, which provided less empirical data than the journal article, was excluded from further analysis (Khoo et al., 2006). A total of ten articles remained in the final sample. Table 31.3 below illustrates the selection procedures, criteria, and search results.

Results

All ten of the articles selected from the four rounds of screening were published between 2007 and 2010; together they reported a total of thirteen independent studies (the Cornejo et al. [2010] article reported two studies, and the Karahasanovic et al. [2009] article reported three studies). These are summarized in Table 31.4 below. Note that Table 31.4 also includes two additional articles: one recently accepted publication that reports our own recent study (Xie, Watkins, Golbeck, & Huang, 2012) and the other brought to our attention via professional contacts (Gibson et al., 2010). These two articles did not appear in the systematic searches due to their
newness. They were nonetheless included in the final analysis due to their direct relevance to the scope of this literature review and the scarcity of relevant work. Together, this final sample consists of a total of twelve articles reporting fifteen independent studies. This final sample was used in the remaining analyses of this study.

In general, the sample sizes of these existing studies were small: the majority of these studies had 5–57 participants (the only exception was Study 1 reported in the Karahanovic et al. [2009] article, which had 500 survey participants). Consistent with the qualitative, exploratory nature of these studies, the primary research methods used in these studies were interviewing (either individual interviewing or focus group interviewing) and observation. Two studies were quantitatively driven, consistent with their use of large volumes of online content generated by users (user profiles or blog posts). The majority of these published studies (9 out of 15) were based on European populations in Norway, Belgium, Finland, and the United Kingdom. Four were based on North American populations, including three in the United States and one in Mexico; one Asian (Singapore); and one Australian population. The smaller number of U.S. studies compared with the number of European studies is especially striking given that the databases used in this literature review were largely U.S.-based, and one would have expected to find more relevant studies conducted in the United States than other places in the world. More attention is necessary to understand how older adults in the United States interact with social media.

Four studies examined knowledge about perceptions and use of social networking sites in general. Over two-thirds of these studies (11 out of 15) focused on a specific SNS: either a freely available commercial site (Facebook; MySpace; Netlog; My Age Site; MyFriendsOnline; Blogger—Facebook was the only site being studied in multiple studies) or a proprietary site available only to certain users (Age Invader and ePortrait/eBowl, which are under development; and TouchTown, which is already in use). Regardless of the scope of these existing studies, several common themes can be identified, including:

1. Older adults generally have insufficient experience with and knowledge about social media applications and have difficulties using the technologies.
2. Older adults’ initial perceptions of social media are typically negative and appear to be in large part influenced by mass media reports of negative incidents associated with social media use (e.g., cyberbullying among teenagers).
3. Despite these experiential and perceptual barriers, older adults can still be highly motivated to learn to use social media applications—if the circumstances are right.
4. An important type of the “right circumstances” that can motivate older adults’ learning and use of social media is when it becomes

<table>
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<th>Table 31.3 Selection Procedures and Criteria</th>
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<td><strong>Round</strong></td>
</tr>
</tbody>
</table>
| 1: Database selection: 148 databases in eight fields | • Contains journals that publish research articles  
• Allows searches within keywords, abstract, or full text  
• Provides English language coverage  
• Relevant to the subject under investigation | 29 databases were selected |
| 2: Searching with keywords | • Search keywords: (“social media” OR “social networking” OR “social computing” OR “Web 2.0” OR Facebook OR blog OR wiki) AND (aging OR “older adult*” OR elder* OR retire* OR “baby boomer*” OR senior) | 3,025 articles were selected |
| 3: Screening the titles and abstracts | • Technology-mediated social networking (research covering only conventional, offline social networking was excluded)  
• Covers core components of the social media concept  
• Research topic covers issues related to older adults, including intergenerational interaction and relationships | 88 articles were selected |
| 4: Screening the full text | • The same three criteria used in Round 3  
• Reports original, empirical research data | 10 articles selected |
<table>
<thead>
<tr>
<th>Author, Year</th>
<th>Publication venue</th>
<th>Technology application</th>
<th>Research topic</th>
<th>Participant age</th>
<th>Participant location</th>
<th>Sample size</th>
<th>Research method</th>
<th>Key finding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ballantyne et al., 2010</td>
<td>Quality in Ageing and Older Adults</td>
<td>An Internet-based SNS: the About My Age site</td>
<td>Effects of an SNS on older adults' experience of loneliness</td>
<td>69–85</td>
<td>South Australia</td>
<td>6 (two dropped out; four completed the program)</td>
<td>Interview</td>
<td>Use of an SNS helped reduce loneliness, opened a door to new experience, and increased connectivity to others and the world. The one-on-one learning approach was key to the success and long-term sustainability of the outcomes.</td>
</tr>
<tr>
<td>Brandtzaeg et al., 2010</td>
<td>International Journal of Human-Computer Interaction</td>
<td>Facebook</td>
<td>Content sharing, sociability, and privacy</td>
<td>Younger age group: 16–33 (mean = 22); Older age group: 40–64 (mean = 48)</td>
<td>Norway</td>
<td>Younger people: 8; older adults: 8; Total: 16</td>
<td>Interview; usability testing</td>
<td>Older and younger users differed in motivations and use patterns; older users had more difficulties in understanding and using the site.</td>
</tr>
<tr>
<td>Chadwick-Dias et al., 2007</td>
<td>Universal Access in HCI</td>
<td>Web 2.0 applications in general</td>
<td>The changing nature of the web and older users; design considerations</td>
<td>65+</td>
<td>U.S.</td>
<td>5</td>
<td>Interview</td>
<td>Older users have insufficient knowledge and skills to use Web 2.0 applications.</td>
</tr>
<tr>
<td>Cornejo et al., 2010</td>
<td>Collaboration Researchers International Working Group (CRIWG) 2010</td>
<td>A prototype SNS consisting of two ambient displays: ePortrait and eBowl</td>
<td>The role of communication and interaction in maintaining emotional ties with family members (Study 1), and how social networking technology can be designed to help (Study 2)</td>
<td>Study 1: older adults: 65–97; caregivers or family members; Study 2: age of all participants not reported</td>
<td>Mexico</td>
<td>Study 1: 10 older adults, 7 caregivers or family members; Study 2: 4 older adults, 4 younger adults</td>
<td>Study 1: interviews; Study 2: field trial followed by interviews</td>
<td>Ambient displays can monitor older adults' living environment, provide continuous information about their social ties in nonintrusive ways, which may help older adults feel more integrated with their families.</td>
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<td>Author, Year</td>
<td>Publication venue</td>
<td>Technology application</td>
<td>Research topic</td>
<td>Participant age</td>
<td>Participant location</td>
<td>Sample size</td>
<td>Research method</td>
<td>Key finding</td>
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<td>Gibson et al., 2010</td>
<td>BCS Conference on Human Computer Interaction—HCI2010</td>
<td>MyFriendsOnline and Facebook (used in the demonstrations)</td>
<td>Factors affect older adults’ use of SNSs, including offline social networks and understanding of and knowledge about SNSs.</td>
<td>63–86</td>
<td>U.K. (Scotland)</td>
<td>Focus group interviews: 17; individual interviews: 4</td>
<td>Focus group and individual interviews</td>
<td>Offline social networks are in transition in old age; older individuals have negative perceptions of SNSs due to mass media reports, lack experience with and knowledge about SNSs, and have concerns about privacy.</td>
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<td>Karahasanovic et al., 2009</td>
<td>Computers in Human Behavior</td>
<td>SNSs in general</td>
<td>Study 1: Participation in online communities &amp; the consumption, sharing, and co-creation of user-generated content (UGC)</td>
<td>15–74</td>
<td>Norway</td>
<td>500</td>
<td>Survey (using a national representative sample)—macro-level</td>
<td>Older adults rarely participate in online communities or share audiovisual UGC.</td>
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<td>Study 2: Social factors in the offline community that affect use of SNSs to consume, share, and co-create UGC</td>
<td>Not reported</td>
<td>Belgium</td>
<td>87 houses in a neighborhood community with a total of 233 residents (unclear how many of these residents were studied)</td>
<td>Ethnographic: Interviews, participant observation, diary, online monitoring—group level</td>
<td>Older adults can be highly motivated to contribute UGC, under the right circumstances: e.g., for digitizing/sharing collective memory, to be in control of the technology, and to monitor online/offline activities.</td>
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<td>Study 3: Individual factors that affect use of SNSs</td>
<td>50+</td>
<td>Belgium</td>
<td>34</td>
<td>Interviews (via telephone, e-mail, or blog), diary, survey—individual level</td>
<td>Being able to use SNSs is important to older adults; usability is important; anxiety impedes use.</td>
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<th>Author, Year</th>
<th>Publication venue</th>
<th>Technology application</th>
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<th>Key finding</th>
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<tr>
<td>Khoo et al., 2007</td>
<td>International Federation for Information Processing (IFIP) ICEC 2007</td>
<td>Age Invader—a virtual/physical reality interactive game platform for intergenerational entertainment</td>
<td>User testing of the Age Invader system</td>
<td>Group 1: mean = 19; Group 2: mean = 11.7; Group 3: mean = 68.7 (range: 58–80)</td>
<td>Singapore</td>
<td>Group 1: 37; Group 2: 10; Group 3: 10; Total: 57</td>
<td>Observation; pre-/post-intervention survey; focus group and individual interviews</td>
<td>Supporting evidence for intergenerational interaction using the Age Invader system</td>
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<td>Lehtinen et al., 2009</td>
<td>HCI 2009—People and Computers XXIII</td>
<td>A commercial SNS: Netlog (<a href="http://www.netlog.com">www.netlog.com</a>)</td>
<td>Older adults’ understanding of SNSs, use of Netlog, and design implications</td>
<td>58–66 Finland</td>
<td>8</td>
<td>Interviews</td>
<td>The Internet is understood as “a dangerous place,” and SNSs are “places of socially unacceptable behavior”; these understandings hinder use of the technology. Design implications: introduce the technology through social events and provide good privacy management on the sites.</td>
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<td>Pfeil et al., 2009</td>
<td>Computers in Human Behavior</td>
<td>MySpace</td>
<td>Age differences and similarities in the use of MySpace and social capital</td>
<td>Teenagers: 13–19; Older adults: &gt;60</td>
<td>Not reported</td>
<td>Around 6,000 MySpace user profiles</td>
<td>Content analysis of data collected from MySpace user profile pages</td>
<td>Compared with teens, older adults have smaller networks of friends, are friends with a more diverse age range of people, and use less multimedia and self-references on MySpace.</td>
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<td>West et al., 2009</td>
<td>Journal of Youth Studies</td>
<td>Facebook</td>
<td>Friendship; Privacy; Attitudes toward older adults as Facebook friends</td>
<td>21–26 (mean = 22)</td>
<td>U.K. (London)</td>
<td>16</td>
<td>Interviews (via computer)</td>
<td>Mixed attitudes; blurring boundary between the public/private spheres</td>
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<td>Author, Year</td>
<td>Publication venue</td>
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<td>Wilson &amp; Nicholas, 2008</td>
<td>Proceedings of the 2008 ACM Workshop on Search in Social Media (ACM SSM)</td>
<td>TouchTown—a web portal providing e-mail and blog services to retirement community residents</td>
<td>The topologies (structural properties of the network) of online social networks</td>
<td>65+</td>
<td>U.S.</td>
<td>1,260 blog posts from the TouchTown blog during Jan.–Dec. 2007</td>
<td>The most common topological shapes were chains instead of stars, indicating blog use more for the purpose of seeking and disseminating information and less for interaction among blog users.</td>
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<td>Xie, Watkins, Golbeck, &amp; Huang, in press</td>
<td>Educational Gerontology</td>
<td>Facebook; blogs (blogger.com)</td>
<td>Older adults’ perceptions and learning of social media</td>
<td>61–83 ($M = 71.4$, $SD = 8.3$)</td>
<td>U.S.</td>
<td>10</td>
<td>Focus group interviews</td>
<td>During the 7-week period of the study, older adults’ perceptions of SNSs changed from the initial unanimous, strong negative to the more positive but cautious and to the eventual willingness to actually contribute their own content to a blog site created for them. Privacy was the primary concern and key barrier to participants’ adoption of SNSs. Several educational strategies developed during the process appeared to be effective in overcoming their privacy concerns, including: (1) introducing the concepts (what are social media) before introducing the functions (what can social media do); (2) adjust the curriculum to accommodate privacy concerns; and (3) make explicit how social media tools can be relevant to participants’ personal lives.</td>
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As older adults transition to retirement, changes standing how social media can benefit older adults. Recognizing the unique social can help facilitate the formation of offline relations between older adults interested in using new people online, in addition to strengthening found that social media helped older adults meet issues facing older adults. Ballantyne et al. (2010) media may help to address unique social networking gaps have emerged as technology evolves. In comparison, while older adults are catching up with younger people on use of earlier internet applications such as e-mail (Jones & Fox, 2009), their with younger people on use of earlier internet applications such as e-mail (Jones & Fox, 2009), their use of newer applications such as social media still lags (Lenhart, 2009). While the digital generation gaps related to older technology are closing, new gaps have emerged as technology evolves.

Resolving these gaps is important because social media may help to address unique social networking issues facing older adults. Ballantyne et al. (2010) found that social media helped older adults meet new people online, in addition to strengthening offline ties between older adults interested in using social media. As a result, social media may be effective in ameliorating the sense of loneliness experienced by older adults with decreased social contact (Ballantyne et al., 2010), similar to how the internet can help facilitate the formation of offline relationships (Xie, 2007b). Recognizing the unique social challenges facing older adults is essential to understanding how social media can benefit older adults. As older adults transition to retirement, changes typically occur in how they view their social contacts (Gibson et al., 2010; Wang & Shultz, 2010; Shultz & Wang, 2011). This perceptual change may result from losing social contacts established through employment, geographic disbursement of contacts, death or illness, or other transformative life events like divorce (Gibson et al., 2010). Social media provides a new platform for peer-to-peer interaction and community building for geographically disbursed individuals (Meraz, 2009; O’Reilly, 2004). Therefore, social media could potentially transform how older adults view their social life as they transition into retirement (Wang, Henkens, & van Solinge, 2011).

In addition to addressing older adults’ social needs, social media provide a new platform for older adults to share knowledge and information. Wilson and Nicholas (2008) found that older adults using blogs tended to use them to search for and disseminate information rather than for socializing. This finding may be in part a result of the specific social media tool used, as each type of social media tool may be more supportive of certain features than others (e.g., Facebook may be better than blogs in promoting socialization, while blogs may be better than Facebook in facilitating explicit knowledge and information transfer). Education about the different functions of different social media tools is essential for older adults to fully realize the affordances of social media (Xie, 2007a; Xie, et al., 2012). Specifically, older adults may need explicit instruction on using social media to communicate information, especially for social media they already use for socialization. For example, a group of older adults may be enthusiastic users of Facebook to convey affective messages, not realizing that Facebook can also be a powerful tool for sharing information and knowledge. As with socialization, a prerequisite for use of social media for information sharing is an understanding of how a particular social medium can be relevant to older adults’ life (Xie, et al., 2012).

In designing technologies for older adults, one common pitfall is to not include older adults in the design process, making older adults a “relevant but absent” social group in the technological development process and, subsequently, making the technology incompatible with older adults’ needs and preferences (Paquette & Xie, 2010). To ensure older adults’ adoption and use of a new technology, it is essential to gain a good understanding of their needs and preferences early on in the process and to use this understanding to guide the design.
and development. Cornejo et al. (2010) provided a good example: In that study, researchers first identified via in-depth interviews the main factors (e.g., geographic distances, cognitive declines, being unable to use SNSs) that weaken older adults’ emotional ties with their younger family members who communicate frequently through SNSs. Based on this understanding, the researchers designed two ambient displays—ePortrait and eBowl—as physical objects to connect older adults with the virtual world in social media. The ePortrait device retrieves photos from younger family members’ Facebook profiles and then displays the photos in a digital frame; the eBowl device enables older adults to share jokes with family members and give feedback on their photos. Meanwhile, older adults’ presence is monitored by placing a digital ball into a bowl connected to a computer system. By integrating these everyday physical objects with social media applications, the ePortrait/eBowl system creates easy, noninvasive ways for older adults to stay connected to and involved in family lives. Such new interaction patterns provide an innovative way to incorporate social networking technology into older adults’ lives without imposing excessive cognitive load.

Effective technological design for older adults should always consider the unique safety issues facing this population. In the context of online communication, safety concerns include privacy, security, and fraud (Ji et al., 2010). Older adults traditionally experienced the highest levels of fraud for any age group when using more traditional telecommunications technology like the telephone (Princeton Research Survey Associates, 1996). Responsible technological design requires careful consideration of this population's vulnerability to fraud. Designers, educators, and older adult users should work together to strike a balance between the freedom and opportunities made possible by social media and the accompanying potential dangers.

Additionally, privacy, safety, and fraud concerns can make using social media an anxious experience for older adults. Improving older adults’ social media literacy could improve their understanding of the privacy, safety, and fraud issues involved in social media use, reducing anxiety in the process. Older adults’ perception of social media is typically based on traditional media reports that emphasize the danger of using social media (Xie, et al., 2012). For example, Gibson et al. (2010) described how a group of older adults formed a negative perception of social media based on a news story reporting that social media use led to unwanted party guests destroying a house. Unfortunately, safety and fraud concerns do exist (Ji et al., 2010; Princeton Research Survey Associates, 1996), though educating older adults to identify legitimate concerns could help prevent fraud and reduce anxiety. Reducing anxiety is essential because anxiety can impede social media use (Karahasanovic et al., 2009; Lehtinen, Näsänen, & Sarvas, 2009), preventing older adults from enjoying the potential benefits of SNSs (Chen, Wen, & Xie, 2012).

Interventions designed to educate older adults about social media should account for the inherently dynamic nature of the technology. Although certain concepts between different social media applications are consistent (e.g., the ability to establish connections with others), the technology is constantly changing and adapting to users’ needs (Hogan & Quan-Haase, 2010). Simply teaching older adults to use a specific application, such as Twitter, may offer only limited utility. A better approach would be to educate older adults about the fundamental concepts behind social media, along with developing skills that can be transferred across applications as they evolve. Privacy provides an instructive example. Older adults educated about the fundamentals of privacy protection using social media could transfer this ability to the new applications they encounter.

It is important to recognize that despite the safety and literacy challenges facing older adults’ use of social media, motivation to use these applications is strong. Karahasanovic et al. (2009) found that older adults were highly motivated to contribute user-generated content (UGC) under the right circumstances (e.g., digitizing collective memory). Similarly, Xie et al. (2012) found that older adults were eager to contribute content to a blog once it became clear how contributing content could be relevant to their lives. Therefore, as application design increasingly accounts for older adults’ unique needs and abilities, and pedagogical strategies improve, the motivation to use social media will likely be realized through the broader adoption of social media by older adults.

On a final note, although certain characteristics may adhere to older adults as a group, it is important to note that the older population is diverse (Xie, 2003); individual differences in, for instance, education, socioeconomic background, or culture may also influence online behavior (Ji et al., 2010). Future research of older adults and social media should investigate how the use (or non-use) patterns
of older adults with varying characteristics may differ (or be similar).

Conclusion

A systematic review of twenty-nine databases in eight fields found only a total of ten articles reporting thirteen independent studies of older adults’ interaction with social media. Adding our own recently accepted article and one additional article found through professional contacts, we included in the final sample a total of twelve relevant articles reporting fifteen independent studies on the topic of older adults and social media. These studies were small in sample size and exploratory in nature. Nonetheless, they provide valuable insights about the intersection between the older population and social media applications. Several key themes were identified in these studies and shed light on issues related to older adults’ current state of knowledge about and perceptions of social media and their potential in learning to make use of the technology in the future. Key to older adults’ learning and use of social media is creating the “right circumstances” in which older adults can associate the technology with their personal lives and feel in control of the technology instead of the other way around. Design and educational interventions are important in creating these right circumstances.

Taken together, these existing studies suggest that major barriers to older adults’ adoption of social media are both technological and social/cultural. Pedagogical interventions focusing on training older adults in the basic, technical aspects of computer operation can help reduce perceived technological barriers (e.g., Xie, 2011; Xie, et al., 2012). Similarly, innovative design techniques can help make social media more closely aligned with how older adults experience the world (e.g., Cornejo et al., 2010). Social and cultural barriers (e.g., negative perceptions of social media), by coloring older adults’ understanding of social media, have negative effects on adoption and use. Current studies suggest conflicting perceptions of social media by older adults, as evidenced in studies reporting that older adults are highly motivated to learn about social media applications, even though they associate such applications with unethical behavior like bullying. These conflicts may result from the reported lack of knowledge among older adults about social media, or they may simply reflect a broader cultural confusion experienced across all age groups as a result of the rapidly evolving nature of the technology.

Social and cultural barriers should be understood as interdependent, rather than exclusive, of technological barriers. As pedagogical and design techniques improve, older adults’ perceptions of social media will develop and evolve in response to their new experiences.

Future Directions

With the very limited number of existing studies on older adults and social media, much more remains unexplored. Even the common themes identified from these few existing studies, due to the small sample size and exploratory nature of the studies, will need to be examined more systematically before more firm conclusions emerge. Some specific future directions are listed below:

1. What are the general older population’s experience with, perceptions of, and knowledge about social media applications, and how might demographic, socioeconomic, cultural, and other factors predict their experience, perceptions, and knowledge about the technology?
2. How might mass media affect older adults’ use of social media? If the one-sided, negative reports in mass media have negative effects on older adults’ use of social media, how might mass media reports provide a more balanced view of the technology?
3. What other factors may facilitate or impede older adults’ use of social media applications?
4. What are the benefits—and risks—associated with older adults’ use of social media?
5. What design considerations should be taken into account when designing social media applications for older adults?
6. What learning strategies can be effective in promoting older adults’ learning of the technology?

Additionally, future research should examine these issues in the context of intergenerational socialization and information sharing through social media. As researchers learn more about effective social media design and pedagogical strategies for older adults using social media, it will be important to ensure that older adults can fully communicate with younger generations through social media. Intergenerational communication may be especially important for older adults, who typically enjoy socialization with younger relatives and friends. Older adults’ integration with the broader social media community will likely influence a variety of subjects requiring investigation. For example, how will the adoption of social media by older
adults influence how they perceive social media? What design issues will need to be addressed to facilitate intergenerational communication over social media? These important questions will need to be addressed in the future once a better understanding of older adults’ relationship with social media is developed.

Acknowledgements

We thank the Institute of Museum and Library Services for awarding a Faculty Early Career Development grant to Bo Xie. Man Huang and Ivan Watkins were funded as Graduate Research Assistants on this grant during the development of this chapter.

Notes

1. While not included in the final sample of articles (due to, for instance, lack of empirical research data), some researchers have begun to address design-related issues and advocate for a “senior-friendly” Web 2.0 environment (Chadwick-Dias et al., 2007; Jaeger & Xie, 2009). Additional educational strategies for older adults’ learning of technology can be found in, e.g., Xie, et al., (2012), Xie and Bugg (2009), Xie and Jaeger (2008), and Xie (2007a).

References


