Challenging Passive Social Media Use: Older Adults as Caregivers Online

ROBIN N. BREWER, University of Michigan, USA
SARITA SCHOENEBECK, University of Michigan, USA
KERRY LEE, University of Michigan, USA
HARIPRIYA SURYADEVARA, University of Michigan, USA

Older adults are often portrayed as passive social media users who consume content rather than actively posting content. However, this binary divide between active and passive social media use overlooks nuanced kinds of engagement online. Via an eye-tracking study of older adults' Facebook use, this work shows how not clicking or commenting on content can involve engaged kinds of social media use even if they are not visible to other users or to the platform. Older adults' decisions to not actively click or comment on social media content—an act which is often associated with non-engagement—can be intentional and relational acts of caregiving. We draw from feminist care theories to draw parallels between the invisibility of care work that older adults do on social media and the invisibility often rendered in their offline lives. We discuss theoretical, methodological, and design implications for supporting older adults as engaged participants in relational and intentional care work.

CCS Concepts: • **Human-centered computing → Collaborative and social computing theory, concepts and paradigms**.

Additional Key Words and Phrases: older adults, eye tracking, social media, care work, active/passive

ACM Reference Format:
Robin N. Brewer, Sarita Schoenebeck, Kerry Lee, and Haripriya Suryadevara. 2021. Challenging Passive Social Media Use: Older Adults as Caregivers Online. *Proc. ACM Hum.-Comput. Interact.* 5, CSCW1, Article 123 (April 2021), 20 pages. https://doi.org/10.1145/3449197

1 INTRODUCTION

Relationships in older adulthood (ages 60+) play an important role in supporting positive mental health, life satisfaction, and quality of life [27, 28]. Social media provides a powerful opportunity for older adults to maintain and establish meaningful relationships, especially among those who face geographical or mobility barriers that make in-person forms of social support less accessible.

However, older adults have historically been perceived as "passive" users or "lurkers" on social media, in which solely viewing content is seen as an unengaged form of online participation that provides no meaningful interaction [8]. Social media scholarship has suggested that such passive use has detrimental effects on well-being when compared to "active" use, typically defined as engaging in clicking behaviors [13]. For example, people may passively compare themselves to others on social media and then feel worse about themselves. In contrast, socially interacting with

Authors' addresses: Robin N. Brewer, rnbrew@umich.edu, University of Michigan, USA, 105 S. State St, Ann Arbor, MI, 48108; Sarita Schoenebeck, yardi@umich.edu, University of Michigan, USA; Kerry Lee, leekerry@umich.edu, University of Michigan, USA; Haripriya Suryadevara, hsurya@umich.eduu, University of Michigan, USA.

2573-0142/2021/4-ART123 $15.00
https://doi.org/10.1145/3449197

others online correlates with several social benefits such as relationship closeness [25, 74]. However, prior literature on active versus passive use relies on demarcations between posting versus not posting as representative of active or passive use. Inspired by Ellison et al. (2020) [24], this paper interrogates those assumptions in the context of older adults, exploring whether and how passive social media use might also be a highly engaged behavior. In doing so, we build on a growing acknowledgement that older adults are active social media users whose use should be valued in its own right, rather than only in comparison to younger users [8, 9, 42, 55, 58, 60].

We adopted a novel mixed-methods approach to examine older adults' social media behaviors. We invited older adults (N=25, ages 60+) to browse their own Facebook News Feeds while we captured their behaviors using an eye tracking device. We then conducted follow-up interviews to discuss their browsing patterns and their general social media behaviors. Prior studies have typically relied on log file data, which may over-report behaviors that generate trace data while overlooking other kinds of engagement. An eye-tracking approach allows us to capture content that older adults engage with, even if they do not click or comment on it.

We find that although older adults view content more than they click or comment on content, they do so as a form of relational maintenance and conflict avoidance. We examine their relational and intentional browsing behaviors through the lens of care work. Specifically, we adopt a feminist care lens, which considers care work as relational and intentional, and acknowledges care as influenced by power, trust, and autonomy [20, 26, 67]. A care work lens centers older adults' experiences of relationships, autonomy, and (in)visibility in their social media use. Older adults have historically been perceived as recipients of care, with aging and care literature typically engaging with health and medical connotations of care (e.g., older adults as recipients of caregiving or as informal caregivers offline). We use a feminist lens to advance perspectives of care and aging, examining how older adults do care work themselves in social media contexts. As such, this work makes the following contributions:

(1) shifts away from active and passive binary divides to a spectrum of engagement types and motivations;
(2) draws parallels between the invisibility of "passive" social media use and the invisibility of care work; and
(3) advocates for older adults as givers, rather than only recipients, of care.

2 RELATED WORK

Our research bridges perspectives from HCI, social media, aging, and communication studies. This section reviews two areas of prior work: older adults' social media use and age-based care narratives.

2.1 Older Adults' Social Media Use

2.1.1 Active versus Passive Social Media Use. A wide range of scholarship has called for movement towards more fine-grained measures of social media use that focus on what people are doing rather than only amount of time spent online [49, 50]. One emerging distinction has been between active and passive social media use. Active use refers to direct interaction with others via commenting, reacting, retweeting, etc [73]. In contrast, passive use, or lurking, refers to scrolling and browsing but not interacting with or responding to content in ways that leave visible traces [47, 73]. Research suggests that active use relates to increases in well-being whereas passive use can lead to decreases in well-being, such as negative social comparison [12, 13, 72, 73]. Aligned with the goal of developing more nuanced measures of use, this study examines the nature and motivations of passive use. In the context of older adults, this argument is especially important when combined with harmful

perceptions of older adults as merely passive members of society in both offline and online contexts [8]. Thus, our first research question is:

RQ1: How do older adults engage with content on social media?

2.1.2 Older Adults as "Passive" Social Media Users. Prior work positions older adults as lurkers in online communities (e.g. [16, 45, 70]). As originally defined, lurking is a non-public form of participation [46] and lurkers consume, rather than create, content. A previous study of older adults using age-specific online communities shows most were "lurkers" or "present absentees", viewing content more than replying to content [45].

Similarly, in a study of how lurkers use online patient support groups, lurkers in these communities were slightly older, had lower digital skill, and lower social well-being. Findings suggest people may not contribute to online communities due to lower levels of satisfaction or less desire for social interaction [70]. Findings from Chang et al. (2015) show how older adult Facebook users have more selective friend networks (fewer friends, but more meaningful relationships) and are less "active" (post less, and check information less often) than younger Facebook users [16].

Yet, a study of older adults using virtual communities shows how reading content was perceived as a meaningful activity and calls for more research on why lurkers remain in online communities [38]. A more recent case study of voice-based blogging communities challenges dichotomous notions of passive versus active social media use amongst older adult bloggers [9]. Findings show how they primarily listened to others' blog posts, which would typically be framed as a "passive behavior," but older adults found this interaction emotionally meaningful, something typically associated with "active" online activity [9].

More generally, research in HCI and CSCW communities shows older adults can be active contributors in social spaces online (e.g. [8, 58, 60, 75]). In this work, we examine traditional narratives of older adults as lurkers in online communities by studying their in-situ browsing behaviors on Facebook. We also interrogate the concept of passive online activity and explore whether it can be an active and meaningful type of engagement.

2.1.3 Factors Influencing Social Media Participation. Prior work describes how older adults' lack of social media use, or limited interactions on social media, may be due to their concerns about privacy, trust, and social pressure [33, 56]. An interview study with older adults showed how they were cautious about any information they shared online, often limiting the amount and type of personal content they shared on their public or private profiles such as name, birth date, address, or photos of family members [56]. The pressure of reciprocation and needing to respond to others on social media can also negatively affect older adults' participation. Perceived expectations for engaging with others, particularly weak social ties, may deter older adults from getting involved in online communities because relationships can be "too much work" to maintain [33, 43]. Brewer et al. (2016) describe how how older adults spend time crafting meaningful messages to their online audiences as they value deep personal communications [8].

As older adults continue to participate in social media [52], it is important to understand how these narratives are evolving and to do so in a way that values older adulthood and aging as worth of study in its own right, not just in comparison to younger age groups. Motivated by prior narratives of older adults as a growing demographic of social media users, but whose portrayals as passive require more exploration, we propose the following research question:

RQ2: Why might older adults choose to browse rather than click on content on social media?

2.2 Aging and Care

In this paper, we use care as an analytical lens through which to understand older adults' browsing behaviors and motivations. Care is a polylithic concept, and can range from medical care to radical

care to social care to self-care [6, 7, 17, 36, 59]. Some perspectives on care have been critiqued as patronizing or disempowering, such as in medical models of healthcare that emphasize healthcare as the removal of disease rather than taking a holistic view of a person [10]. We draw from feminist studies in our framing of care, using Fisher and Tronto's description of care as "everything that we do to maintain, continue, and repair our 'world' so that we can live in it as well as possible" [26]. Feminist care considers power relationships in care work, and the relationship of care to justice, trust, and autonomy [20, 66]. These conceptualizations of care can include intangible forms of "caring about", or actionable forms of "taking care of" an entity or "caregiving" [26]. Care has often been associated with aging communities in HCI and CSCW, but primarily with respect to older adults being the recipients of care (being taken care of) or in their work as informal caregivers (e.g., to a spouse) in medicalized and patient-centered care contexts [29, 54]. As such, technology-related research on caregiving and aging has often focused on digital tools to manage the health and well-being of older care patients or minimize caregiver burden (e.g. [18, 62, 64, 65]), with few exceptions (e.g. [55]). In this paper, we seek to shift depictions of older adults as recipients of care towards one that recognizes their role as caregivers in digital spaces.

2.2.1 Care as Relational. De La Bellacasa states that "to care about something, or for somebody, is inevitably to create relation" [23]. As such, care is inherently relational, and describes the inherent social nature of showing care or engaging in care acts towards others. Literature on relational care and aging emphasizes the importance of care networks, including the older adult, family, caregivers, social workers, and other care staff, for well-being (e.g. [3]). In offline care contexts, relational care work can mean spending time "sitting and chatting to our residents, listening to their concerns and fears and ... their stories, history of their life" [22]. Here, listening is an act that helps build a relationship between at least two members of a care team. Prior work has challenged the passive nature of how social relationships develop between caregivers and older adults [34]. Other work challenges older adults as only passive users of technology, for example, by designing ways for older adults with dementia to creatively share their experiences [39]. Relational care is also symbiotic, being needed "after giving too much to others or as a way of keeping care for others sustainable"[32], and can include self-care and radical care as a means of maintaining one's social and psychological well-being.

Social well-being is a factor that is known to contribute to healthy aging. While there is conflicting research regarding the impact of social media on older adults' well-being, there are some established benefits. Theories of aging (e.g. Carstensen's socio-emotional selectivity theory [15]) support adults seeking more emotionally meaningful relationships as they age. Social media platforms help people of all ages maintain such relationships with family members and close friends at a distance [11]. This form of remote connection can be particularly useful for friends and family who live far away or for older adults with disabilities. Because social media platforms provide ways for users to engage with others online (e.g. asynchronous messaging, showing support through "likes"), prior work suggests older adults may use Facebook to combat loneliness. Although Bell et al. (2013) do not find social media use to be a predictor of loneliness, social satisfaction or "satisfaction with social roles and activities" does correlate with older adults' Facebook use [4].

2.2.2 Invisibility of Care. Despite being highly relational, care can often be invisible, and thus rendered both undervalued and unreciprocated. In literature on care and aging, older adults' caregivers argue invisible labor is one of the most demanding parts of their job and can negatively impact their well-being (e.g. [18]). However, the invisibility of care work can also persist when older adults are the ones doing the care work, and in technology-mediated contexts where care work is being done. For example, Lindley's work on older adults' use of a cross-generational communication tool shows "grandparents and uncle[s] making an effort to indulge younger family members, but

with little evidence of the reverse" [41]. Further research showed how older adults adjust their communication patterns to align more with younger generations as a form of invisible work [42]. Prior work in CSCW discusses how such symbiotic relationships can exist with spousal caregivers or other family members who may engage in support roles with older adults requiring full-time care [62]. These caregivers may need "a break" from their care roles and turn towards hobbies or community activities to do so [65]. For example, Chen et al. (2013) discuss the emotional and social experiences of being an informal caregiver for an older adult, finding that being in a care role is integrated into every facet of one's life [18]. Thus, "managing integrality", or how to integrate caregiver expectations with other life demands, is about coordination and collaboration to support one's overall well-being. In this paper, we discuss how invisible social media behaviors can also be a form of caring for one's own well-being and maintaining relationships (online and offline).

3 METHODS

Studies of active and passive social media use have typically relied on log file data to discern "active" (i.e., clicking, commenting) versus "passive" (i.e., the absence of clicking, commenting) behaviors. We developed a mixed-methods study design that paired eye-tracking with qualitative (interviews) and quantitative data (log files, surveys), similar to procedures in [24]. Our study design included: eye-tracked browsing session, activity log capture, post-survey, and post-interview data with older adults (n=25). This paper draws from the browsing session, activity log capture, and post-interview to address our research questions. This study was approved by our institution's Institutional Review Board.

3.1 Study Protocol

3.1.1 Browsing Session. First, older adults were asked to complete a brief browsing session on Facebook. While Facebook's activity log feature captures clicks and comments (i.e. likes, comments, posts created), our primary research questions sought to understand their behavior on social media beyond click and comment data. Because prior work measures engagement through visible click behaviors, in the remainder of the paper we refer to click data/behavior as anything that generates a visible trace to other users on Facebook. For example, commenting would be categorized as a click, but opening a link to a news article would not. To capture their click and non-click behavior during this browsing session, we used the Tobii X2-30 eye-tracking device. This device was unobtrusively mounted to the bottom of a computer monitor and re-calibrated for each participant. To test calibration and normalize the visibility of the tracking device, participants were first asked to view a neutral website (anonymized) for two minutes. After the two minutes, the researcher initiated the Facebook browsing session.

An initial pilot test where we instructed participants to browse for 10 minutes indicated that the duration was too long, so we chose seven minutes for the browsing period. As such, during the browsing session, participants logged into their Facebook account and were instructed to browse their own Facebook News Feeds for seven minutes. We asked participants to browse their own feeds instead of an artificial feed to increase ecological validity. Participants were encouraged to engage with the News Feed (their personalized list of posts on the Facebook homepage) as they normally would, including adding any reactions (e.g. likes) or comments. To establish some consistency and novelty in the News Feed experience, we asked participants to refrain from logging into Facebook 24 hours before their browsing session, though we did not confirm or enforce them doing so. Due to an eye-tracker malfunction, the browsing data from two participants (P1 and P7) are excluded.

3.1.2 Activity Log Capture. To understand whether the participant's interaction during the browsing session represented their typical behavior, the researcher obtained activity log data from each

participant. To do so, the researcher asked the participant to log into Facebook, navigate to their Activity Log, and scroll through one week of log data. This web page was then saved, with visually identifying information (e.g. photos, videos) removed.

3.1.3 Interviews. Immediately following the browsing session, a researcher conducted a follow-up semi-structured interview with each participant. These interviews consisted of questions to understand their general Facebook browsing behavior, motivations for using Facebook, and motivations for choosing whether or not to interact with content on the platform. On average, these interviews lasted approximately 16 minutes (max = 31 minutes, min = 10 minutes).

After the interviews about general use, the researcher engaged participants in an activity review session. During this session, the researcher opened the eye-tracking software, replayed the gaze video of the seven-minute browsing session, and, at random, chose segments of the browsing session to ask questions about. For example, if a segment contained an instance where a participant clicked on content, the researcher asked the participant to explain their decision to click. If it were a segment where the participant appeared to be viewing content (as depicted visually by red circles on the replay video), but did not click, the researcher asked the participant to say more about what they were thinking about when they viewed this content (but did not click on it).

3.2 Analysis

3.2.1 Browsing Session. The seven-minute browsing session was analyzed by a member of the research team, focused at the post and feed level. At the post level, we coded for view duration, who created the post, who shared the post, topic content, and click type. At the feed level, we calculated the feed browsing duration, number of posts in feed, aggregate view duration, and number of visible clicks. We describe each of these in detail below:

(1) **View duration (in seconds)**: the time a participant spent viewing an individual post including components of the post (poster name, content of post, reactions, or comments of post). This excluded time spent viewing content outside of the News Feed, for example, a news article on a different website.
(2) **Who shared the post**: the entity who posted the content as either a Facebook friend, group, page, or advertisement. For example, a post from a page could have been shared by someone in a group, in which case the entity who shared the post would be coded as group.
(3) **Who created the post**: the original entity who created the content as either an organization or person. For example, a post from a page could have been shared by someone in a group, in which case the entity who created the post would be coded as organization.
(4) **Topic content**: the topic of the post as either entertainment, personal update, non-political news, political news, or other. Note, the topic content categories were not mutually exclusive, meaning a post's topic could be coded as political and entertainment.
(5) **Click type**: visible clicks on the News Feed on including a reaction (e.g. like, haha, wow), comment, or share. This excludes clicks to external sources, such as a news article, which introduces exogeneous behaviors that could not be observed. Note, exogenous behaviors were excluded for both click and not-clicked viewing.
(6) **News Feed browsing duration**: the aggregate time (in seconds) participants spent on their News Feed. It includes time viewing photos, videos, and other content that is in the main content feed, and excludes other activities beyond the feed such as the Pages Feed, reading private messages, or checking notifications.
(7) **Number of posts in feed**: total number of posts, including ads, group content, etc. that appeared in one's News Feed during the seven-minute browsing session

(8) **Number of visible clicks**: total number of posts with any form of visible click interaction such as a reaction, like, or posting a comment. This does not include clicks involved with viewing more comments, viewing a video, or browsing through additional photos.

3.2.2 Activity Log Capture. The activity log data represented a few days of Facebook activity prior to their interview date and captures visible traces of behavior on the social media platform. One researcher aggregated the following variables for each participant: number of posts, number of likes, number of comments. Counts were normalized by number of activity log days collected (which varied slightly by participant). A Pearson's correlation analysis shows that participants' behavior during the seven-minute browsing session was moderately to strongly correlated with their average behavior per day leading up to the study (r=.71, see Figure 1, indicating some ecological validity of the lab environment.

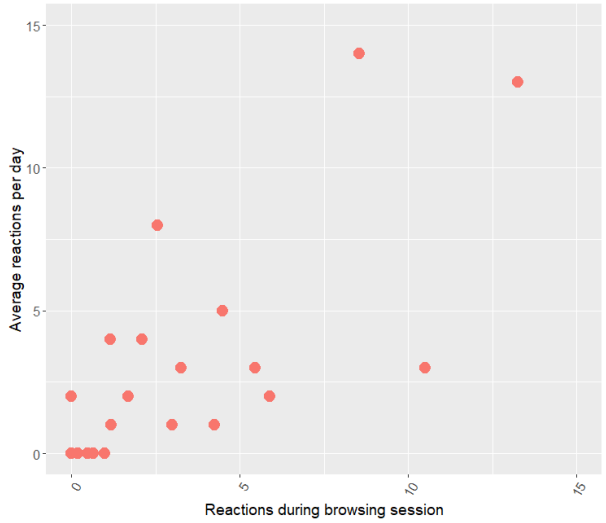

Fig. 1. Reaction behavior during session is correlated to reaction behavior in days prior to session, Pearson's r=0.71.

3.2.3 Interviews. All interviews were audio recorded and transcribed. One member of the research team reviewed the transcripts and used inductive and deductive approaches to develop an initial codebook based on patterns across interviews (e.g. deliberate not clicking, identity as a Facebook user) and prior research (e.g. motivation to use, content clicked, types of clicks). The researcher iteratively coded the transcripts using the qualitative analsis software, NVivo, through a process which included frequent discussion, reflection, and refinement with the research team. We chose not to conduct interrater reliability because we did not report quantitative patterns from the qualitative data, and we prioritized the first author's expertise in the data coding process [44].

3.3 Recruitment and Demographics

We recruited older adults through an online participant recruiting pool at our university and through flyers at a local senior center. Inclusion criteria specified that they must be over the age of 60 years old, have a Facebook account, and be able to travel to a local senior center for interviews. We chose to recruit from the online recruiting pool and senior center to increase participant diversity. The online pool is hosted by our university, a large R1 institution in the United States, and attracts

people who currently have or had an affiliation with the university or its medical system. Informal and informational events at the local senior center attracts older adults within the community who may not have an affiliation with the university. We recruited 25 older adults to participate in the study. More details about participant demographics and click behavior can be found in Table 1.

Table 1. Participant demographics and observed click/comment behavior

PID	Age Range	Gender	Race	Education	Income	Num Clicks
1	70 - 79	Male	White	Undergraduate degree	$30-49K	eyetracker error
2	70 - 79	Female	White	Graduate degree	did not report	18
3	60 - 69	Female	White	Some college	< $30K	15
4	70 - 79	Female	White	Graduate degree	$50-74K	2
5	60 - 69	Female	White	Graduate degree	$30-49K	5
6	60 - 69	Male	White	Undergraduate degree	< $30K	13
7	60 - 69	Female	White	Graduate degree	> $75K	eyetracker error
8	70 - 79	Female	White	Graduate degree	$50-74K	2
9	60 - 69	Male	White	Undergraduate degree	< $30K	2
10	70 - 79	Male	White	Undergraduate degree	< $30K	0
11	60 - 69	Male	White	Undergraduate degree	> $75K	2
12	60 - 69	Male	White	Undergraduate degree	$30-49K	2
13	60 - 69	Male	Black	Some college	< $30K	1
14	70 - 79	Female	Asian	Graduate degree	> $75K	0
15	70 - 79	Male	White	Undergraduate degree	< $30K	1
16	70 - 79	Male	White	Graduate degree	Undergraduate	2
17	70 - 79	Male	White	Graduate degree	$50-74K	0
18	80+	Female	White	Graduate degree	> $75K	2
19	70 - 79	Male	White	Graduate degree	> $75K	4
20	60 - 69	Male	Other	Graduate degree	> $75K	4
21	70 - 79	Male	White	Graduate degree	> $75K	0
22	70 - 79	Male	White	Graduate degree	> $75K	1
23	70 - 79	Female	White	Undergraduate degree	$30-49K	3
24	70 - 79	Female	White	Graduate degree	> $75K	10
25	60 - 69	Female	Black	Undergraduate degree	$50-74K	2

4 RESULTS

In the first section we briefly describe older adults' social media browsing behaviors, including clicking, commenting frequency, and viewing patterns. In the second section we describe how a subset of these browsing behaviors were relational, exploring differences in who older adults view content from and why. In the third section, we explore intentional click behaviors and abstention from clicking through the lens of care work.

4.1 Overview of Older Adults' Browsing Behaviors

On average, participants encountered 37 posts during their browsing session (min = 3, max = 95, SD = 20.10). They viewed each post an average of 6.78 seconds (min = 0, max = 55, SD = 7.47). Of the total posts (N=808) viewed on News Feeds across the 23 browsing sessions, participants commented on 1.5% of posts and reacted (e.g. like, haha, wow) to 9.28% of posts. Participants viewed but did not click on 89.35% of the content.

To examine social media browsing behaviors, we compared time spent viewing posts with visible traces of clicks (i.e., "active" use) versus time spent viewing posts that are not clicked (i.e. "passive" use). These visible clicks include commenting, reactions, and sharing. We ran a linear mixed model due to the nested nature of the data with multiple posts viewed per participant. Time spent viewing was the dependent variable and number of clicks or comments was the independent variable. We find that participants viewed content that they clicked or commented on significantly longer than content that they did not click or comment on (M-clicked=11 seconds, SD-clicked=10.51; M-notclicked=4, SD-notclicked=5.89) (β = 8.9992, p < 0.001) (see Figure 2).

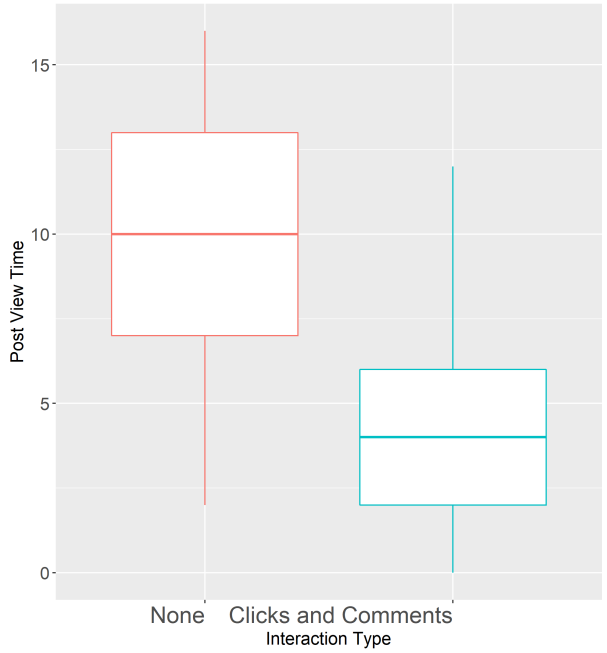

Fig. 2. Relationship between viewing time and interaction type.

4.2 Older Adults' Browsing Behaviors are Relational

This section explores how engagement varies by who created or shared the post and draws from interview data to explore that engagement.

We quantitatively measured time viewing content based on who shared the post (i.e., a person or an organization) and who created it, which could differ from who shared it if a person was resharing content created by someone else (Figure 3).

To analyze behavioral data based on who created the post, we ran a linear mixed model with time as the dependent variable and post creator as the independent variable. Results indicate significant differences with participants viewing posts from people (M=4.5 SD=10.18) more than from organizations (M=4.0 SD=6.87) (β = 1.6046, p < 0.05) (see Figure 3). Posts created by Facebook, such as happy birthday reminders or 'on this day' memories were infrequent and removed from analysis.

To analyze data based on who shared the post—which could be a Facebook Friend, a Facebook group, a Facebook page, or an advertisement—we again modeled time as the dependent variable

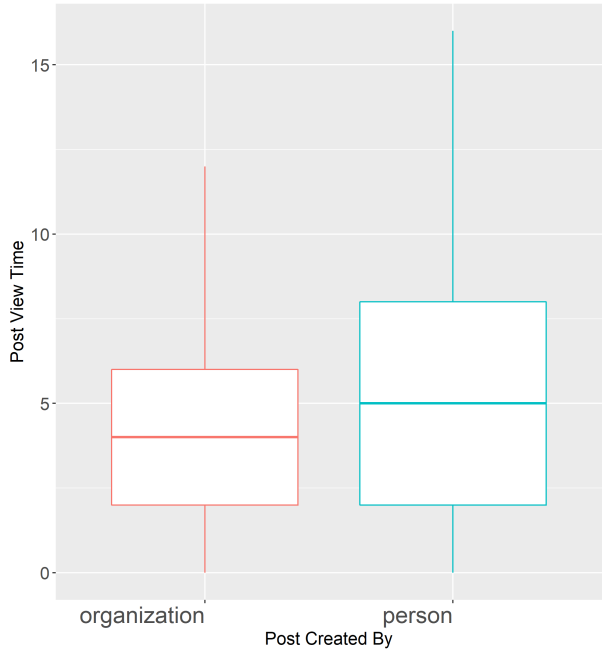

Fig. 3. Relationship between viewing time and who originally created the post.

and who the post was shared by as the independent variable. With pages as the reference variable (M=3 SD=5.92), participants spent significantly more time on posts from Friends (M=6 SD=8.43; β = 0.696, p < 0.001) or groups (M=5 SD=6.8; β = 1.118, p < 0.05) and significantly less time on advertisements (M=2 SD=2; β = -2.2126, p < 0.05).

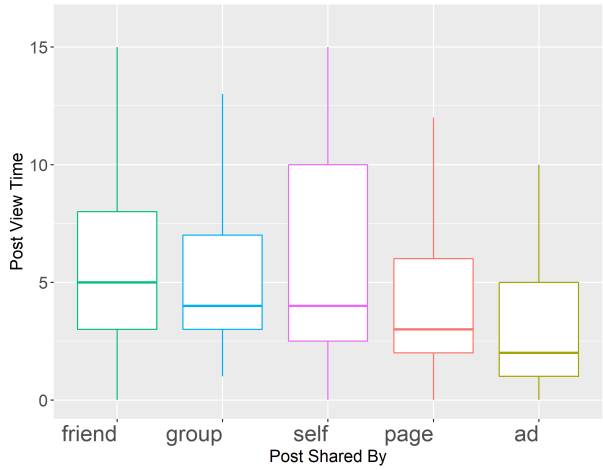

Fig. 4. Relationship between viewing time and who posted the post.

Taken together, quantitative results demonstrate how older adult participants spent more time viewing content from another person (Facebook Friend or Facebook group) than content affiliated

with an organization. In the qualitative interviews, participants explained that these behaviors aligned with their relational motivations to use Facebook primarily to keep up with family and friends. P8 said,

> "*I don't particularly like Facebook, but I stick with it because my daughter and my step daughter and friends use it a lot, and it is a way for me to keep in touch with them. Keep up on pictures and what is going on in there life.*"

Similarly, P17 said, "*I do get posts from my grandkids, babies, great great great grand babies. I love them and sometimes my kids will post on there and various things and so I keep in touch with my family too.*" P17 described how many of her Facebook interactions centered around family. Although she preferred to speak with them by phone, "*I have to live with what [it] is and I'd rather hear from them than not hear at all.*"

This quote shows a commitment to using social media sites like Facebook to maintain relationships on those sites. Their decision to interact with family members' content on social media often mirrors their offline values and behaviors. In the next section, we analyze how some of these click behaviors are a demonstration of values around showing care.

4.3 Intentional Browsing Behaviors as Acts of Care

This section examines older adults' browsing behaviors through the lens of care. In some cases, older adults intentionally show care through clicking, specifically by commenting on posts of close family ties. In other cases, their explanations for abstaining from click behavior echo prior literature depicting these behaviors as passive or lurking. For example, P8 said, "*I'm what's called a lurker*" and P24 said, "*I just try to kind of look at things rather than making comments.*" P8 commented on 2 out of 41 posts viewed during the browsing session and P24 clicked or commented on 10 out of 33 posts viewed during the browsing session. Although P24 interacted with content more frequently than other participants, she still perceived her browsing activity as primarily viewing and rarely posting her own content (i.e., status updates, photos). In some instances, clicking content was an outward act of care.

4.3.1 Clicking as Care Giving. In two instances, participants described how they commented on family members' posts to demonstrate care. For example, P23 describes engaging with her son's posts and how she "*[made] a comment so that everybody knows that he has a mother that loves him.*" In this quote, P23 is engaging in an act of performance, with a traceable behavior on Facebook equating to an outward act of care towards her son. Similarly, P1 described commenting on his granddaughter's posts saying, "*[I] say supportive things to encourage her.*" P1 described using Facebook to "balance things" happening in his own life, also intentionally seeking out positive content such as cat videos. These quotes indicate ways that older adults are thoughtfully curating the sentiment of the content they receive and content they post, particularly towards their family members. Although relationships on social media are often depicted as visible, interactive experiences [11], many other participants intentionally abstained from clicking or commenting on content to preserve relationships and to manage future interactions.

4.3.2 Not clicking or Commenting to Preserve Relationships. One of the most prevalent themes in our data was the decision to intentionally not click on content to avoid conflict and relationship disruption.

During the seven-minute browsing session, 111 political posts were displayed to 10 participants across the browsing sessions. Among those, participants spent 6.94 seconds viewing those posts and 5 participants reacted to the posts. In the interviews, 16 participants described avoiding political content on Facebook. Participants said "*most of the time, I don't respond to political stuff*" (P8), and

described doing so because "*people get in there and start ranting on one side or the other and I'm not interested in that*" (P15). Their desire to avoid conflict resulted in deliberate decisions to not click content. It also aligned with a desire to avoid negative experiences with others as expressed by P25 who "*refrain[s] from being negative or commenting on people's negativity.*" P25 continues by describing how she also asks younger family members on Facebook to avoid visible negative encounters on the platform. She also described limiting overall Facebook activity to avoid exposure to political content saying, "*when Facebook first started I was more involved and then it kinda got where I had to eliminate some people because...there's this political thing and I'm not a political person and this Trump and Obama just started that kinda turned me off.*"

Participants (N=10) described experiences where they had been involved in conflict on social media and expressed disinterest in reading or posting potentially argumentative content on Facebook. P1 described how he "*had a situation with somebody sometime ago and I keep remembering that things escalate so quickly when you try to comment or interact it just goes ballistic way too quick and you can't have a conversation hardly.*" This experience was sufficiently memorable in that it limited P1's future behavior online, aligning with literature on digital conflict (e.g. [30, 35, 57]). Similarly, P20 said:

> "*if I put an article that is controversial politically and they start back and forth, I just cut it. Or sometimes I even just delete the whole thing....[I] created some enemies...the election before, I was very active in the, I'm anti-abortion and pro-life...So, the time I used to put some of these and then people start[ed] crying. I lost some friends because of that.*"

Because of the responses to P20's "controversial" political views, he modified how and what he posted online to maintain friendships. We observed similar, often stronger, desires to preserve relationships with family members. For example, P8 said,

> "*if it really gets out of line, especially if it's from my nephew, I'll make a comment… it's not typical because I don't really want to engage and I don't want to stir problems with my nephew.*"

In this quote, we see how commenting is being described as an atypical behavior, only enacted in extreme circumstances. The cost of engaging in such behavior is weighed against potential consequences such as causing conflict with a family member, leading to the decision to reflect on whether to engage with social media content and/or intentionally not engage with this content.

Choosing to avoid political content also revealed themes of participants taking care of their *own* well-being. This kind of self-care was revealed via the intentional choice to not click. For example, P1 said, "*they're not operating logically so using logic to talk them is you know...so I just move on from it...some of the political stuff I just skim through... A lot of the time it's just stuff that gets you fired up... Might get passed.*" This quote highlights P1's frustration with online discourse, and the decision to deliberately not comment to not get "fired up". P25 echoed these sentiments, saying:

> "*I think when Facebook first started I was more involved and then it kinda got where I had to eliminate some people because people are just putting too much personal information and I wasn't interested and then there's this political thing and I'm not a political person and this Trump and Obama just started that kinda turned me off. You know because people were um giving negative comments and and I'm not a I'm not a negative person so I kinda that kinda stopped me for a while*" (P25).

4.3.3 Not Clicking or Commenting to Manage Future Interactions. To sidestep the limitations of interaction on the Facebook News Feed, some participants described shifting to other channels such as email (N=8), face-to-face (N=9), Facebook Messenger (N=7), or through text messaging (N=4). For example, P23 noted: "*I'll do that on my phone, I'll do that on text message cause the phone is right*

there the text message is right there I can do that a lot easier on the phone than I can on Facebook." Here, P23 is referring to posting content on Facebook and instead preferring to contact people directly by phone. This behavior is connected to her role as the "information guru" in the family; she describes herself as "*the sort of person that collects information and so I collect lots of random things. My children were always saying, 'Mom why are you telling me this?' 'I don't know honey someday you might need this information just catalog it in the back of your brain and you'll have it when you need it.'*"

Some participants emphasized that they would observe what their adult children and grandchildren were doing on Facebook and then discuss it when they next talked on the phone. This included behaviors like "*if I see something interesting or funny I'll mention it to when we're together or when I talk to her*", "*I know I saw you post about it on Facebook the other day*", or "*did you see that Facebook post?*"

While prior literature shows how reciprocity is a behavior that older adults value in online interactions [33, 40, 43], we observe how two older adults in our study felt pressured to reciprocate interactions online and that this expectation may negatively affect their well being. For example,

> "*...when I post something and people like it, they say it's like endorsing it, and when they endorse me I tend to endorse them more frequently even though they post a lot more than I do. So that one of Dee and her family, one of the reasons I automatically liked because she always likes*" (P4)

Although liking behaviors have been shown to be an act of support [76], this quote suggests that actively engaging with content can start to feel obligatory, and that participants may refrain from engaging with others content as an invisible act of self-care.

5 DISCUSSION

Our initial research questions asked (1) how older adults engage on social media and (2) why older adults browse social media without clicking or commenting on content. Our results confirm prior work suggesting that older adults engage in primarily passive behaviors on their Facebook News Feeds [31]. However, our results also suggest that the so-called "passive" framing can overlook important intentional abstentions from clicking or commenting.

These intentional decisions not to engage with content diverge from from prior work that frames older adults' lurking or non-use as being uninterested or unskilled. Our study shows that older adults may be engaged with content—viewing it and paying attention to it—but may choose to avoid clicking or commenting to preserve relationships and their own well-being. We draw on feminist care theory to argue that older adults can enact care work online through intentional abstention behaviors that are both visible and invisible. Below, we discuss how our findings challenge the dichotomous framing of online engagement as passive or active and reflect on design implications for the sociotechnical nature of care work.

5.1 Moving Beyond Passive/Active towards Engagement as a Spectrum

Our results showed that participants spent more time viewing content that they did not click or comment on than that they did. These results confirm prior work suggesting that older adults engage primarily by viewing content on their Facebook News Feeds rather than by clicking or commenting on it [31]. However, participants refrained from clicking or commenting on content to preserve social relationships.

Our data show how older adults were intentionally choosing not to engage. This contrasts prior scholarship suggesting that older adults may be "less vulnerable to peer pressure...and, therefore, are less concerned with what they or their Facebook friends are posting" [77]. Instead, older adults

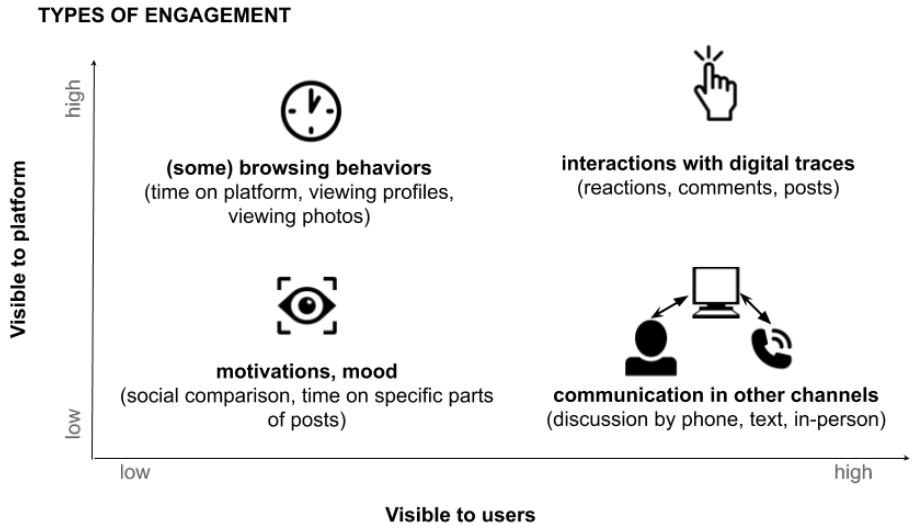

Fig. 5. A framework for how people engage online, diverging from traditional framing of passive vs. active to level of visibility to the user and platform

intentionally refrained from commenting or liking controversial content on Facebook, such as political posts. They also shifted to other mediums such as phone calls, text messages, or emails to express their opinions on such content to avoid relationship conflict on Facebook, which some participants had experienced in the past. In doing so, older adults avoided the awkwardness and discomfort of conflict; their decision to not leave visible traces reveals the very political, relational, and imprecise care work of interacting on social media.

Our results indicate that so-called passive social media use, while invisible to other users and to some extent even to social media companies, can be intentional and meaningful. Crawford (2011) and Antin and Cheshire (2010) have described the value of less visible behaviors such as active listening and reading as valid forms of participation on Wikipedia and Twitter [2, 21]. Brewer similarly portrayed listening to phone-based blogs as a form of active listening [9]. Yet, by emphasizing visible clicking behaviors (e.g. comments, posts, likes, reactions) over other forms of browsing behaviors (e.g. viewing posts, reading comments, clicking links to news articles, selectively viewing positive content) in research studies and reports on social media use, older adults' intentional care work becomes further invisible, thus understating the importance of viewing content as a form of participation in aging communities.

Our data show that there are other reasons why older adults may choose to view content online beyond surveillance or disinterest, at times, as a form of care work. One reason clicks are surfaced so prominently on social media (e.g., clicks and comments on Facebook; tweets, likes, or upvotes on

other sites) is that they are easily captured and stored in a database. In contrast, viewing behavior without clicks or comments has been technically difficult to capture. Currently, sites can use browser scrolling and mouse movement to infer behavior but cannot not measure where people pay attention or their engagement levels (though video games with eye-tracking capabilities are moving in this direction [71]).

We propose that social media scholars and platforms frame engagement as a spectrum of behaviors rather than the binary division between active and passive. In Figure 5, we propose a conceptual framework to demonstrate how how older adult participants engage in a spectrum of behaviors on social media with varied levels of visibility, to other users or to the social media platform. While active use has typically been considered the types of engagement that exist in the top two quadrants—high visibility to platform—the types of engagement in the other two quadrants are also meaningful, but more difficult to measure.

5.2 How Care Work Shapes Design

Feminist theories about care offer a framework to think about visibility, which is associated with power and autonomy [20, 51, 66]. Feminist scholarship has underscored the ways that women are often ignored and written out of history—in other words, made invisible [63]. Older adulthood is similarly characterized by multiple forms of invisibility—older adults themselves become less visible in society, both physically and societally [61]. The informal caregiving work that they receive and give is also largely overlooked and invisible [29, 54]. Additionally, feminist care theories highlight that care work can be political, including who gets to decide who is need of care, and how that care is done [26, 68].

Facebook's decision to make reactions and comments visible prescribes a particular kind of value to those interactions. This also shapes the kind of data that are available to researchers —especially those who rely on trace data—and thus the kinds of scholarship that is done. The invisibility of social media behaviors, both among older adults and in general, reveals a kind of care work that is intentional, relational, and political [5, 20, 26, 66–68].

Feminist theories of care shed lights on the messiness of care which does not translate comfortably to design principles. Bennett et al. note that with care work comes the "inevitability of producing relationships inflected with moments of awkwardness, hesitation, and dominance" [5]. Here we reflect on how design choices may have shaped older adults' social media use. In doing so, we explore digital care work as a sociotechnical phenomenon, considering what exists technically and what it supports socially [1], and propose two design directions for online community designers.

Control of less visible behaviors: Feminist care emphasizes power and autonomy as important aspects of care work, but there is a chasm between care work as autonomous, and care work that is shaped by the architecture and design of a site. One way that older adults might gain control over their care work is if sites offer greater control and autonomy over users' ability to decide what should be visible or not. That is, instead of hard coding interactions (reactions and comments) into the site, users might be able to decide how visible or not visible they want care work to be, such as amplifying that they saw comment to an author without having to switch channels or make a public reaction.

Controlling feeds as relational and self-care: Social media users, including our participants, adjust their behaviors on social media to minimize negative interactions on the site [69]. Similar to sites such as Twitter, the ability to temporarily mute specific words on one's News Feed can be a way for users to exert more control over the content they are seeing. Extending this control could also mean allowing people to filter the sentiment they want their News Feed to show (e.g. positive, inspirational) or the mood users are in (e.g. curious). While filtering can increase the potential

of reinforcing existing view points and limited points of view, presenting users with options to manage expectations may support the important self and relational aspects of care work.

From interview data, we see a desire to preserve and strengthen relationships with family members, aligning with literature on aging and social media use [4, 33, 37, 48]. Participants were Facebook friends with younger family members and made intentional decisions to attend to family members' content, whether clicking on it or not. Their practices mimic historical and cultural offline family structures in which older adults provide a source of emotional and physical care work (e.g. custodial grandparenting) [14, 19]. In some cases, participants choose to express their care in visible ways. In others, there may even be an expectation that they make that emotional care visible, as indicated by one participant who comments on her son's posts to let "everybody know that he has a mother that loves him." Much of this care work is invisible and choosing not to click on content can be interpreted, at times, as an act of care.

This same motivation to remain in a caring role also contradicts behaviors to not engage with controversial political content as someone who cares seemingly can not also publicly disagree. Here, lack of engagement, while often seen as disinterest or lack of attention, is actually a meaningful approach to showing interest and attention. These behaviors suggest older adults in our study may be overly cautious about maintaining relationships on Facebook in that actively extending offline care roles to online contexts could prohibit the ways in which they express themselves. Prior work describes how older adults are concerned about loneliness and "actively [try] to maintain their social network and contact with friends in different social activities" offline [28]. Our findings suggest that similar behaviors are conducted in online spaces. Although we focus on older adults in this paper, recent reports show how people of all ages are modifying their behavior on social media and in some cases limiting it due to increased concerns (e.g. privacy) [24, 53]. However, other age groups are likely to use a variety of other social media platforms to engage with others online. Since older adults primarily engage on social media using Facebook, these acts of relational care have the potential to significantly limit the quantity and quality of their digital social interactions, particularly if choosing to engage with content that may upset their online networks may end or damage existing relationships.

5.3 Limitations

In this section, we note a few limitations of our study. First, we conducted this study in a quasi-naturalistic environment: a private room in a local senior center. While this may have affected the ecological validity of the study, analysis of the activity logs show participants' behavior during the seven-minute browsing session correlated with their activity in the days prior to the study. Also, using the eyetracking software required a computer with certain specifications that could only be controlled if we used the same computer and set-up for each participant, making the lab environment the best option. We limited the browsing session to seven minutes; however, participants may typically scroll longer or shorter than this duration. Additionally, our sample was biased towards the population of older adults in and around the senior center community through which we recruited and our data may reflect priorities and values local to that center. Last, our work focuses on browsing behaviors on Facebook. We expect browsing behaviors to differ depending on the type of content afforded within the platform and audiences prioritized. For example, Snapchat's temporal video feature may result in less political memes/opinions being shared and therefore affect browsing behaviors in different ways. However, behaviors on Facebook may transfer to other communities with similar affordances. We encourage researchers to study cross-platform browsing behaviors.

6 CONCLUSION

Older adults have typically been portrayed as passive social media users. In parallel, older adults have typically been portrayed as passive recipients of care work. Our results show how older adults engage in active forms of care work on social media, even though such work may not be generating visible social media traces. Researchers and designers should value older adults' agency to choose not to contribute in ways that social media companies value (e.g. click data, total time spent on site), and that more invisible kinds of behaviors are also important. Additionally, social media platforms should provide tools to support older adults engaging as engaged caregivers in their online spaces. Future work could extend empirical findings in this work to inform the design of platform-level features that give social media users better control of their browsing preferences (e.g. sentiment-based post-filtering, amplifying content viewing) and platform designers a more nuanced understanding of online engagement.

ACKNOWLEDGMENTS

We would like to thank Wendi Tang for her efforts in data collection.

REFERENCES

[1] Mark S Ackerman. 2000. The intellectual challenge of CSCW: the gap between social requirements and technical feasibility. *Human–Computer Interaction* 15, 2-3 (2000), 179–203.

[2] Judd Antin and Coye Cheshire. 2010. Readers Are Not Free-Riders: Reading as a Form of Participation on Wikipedia. In *Proceedings of the 2010 ACM Conference on Computer Supported Cooperative Work (CSCW '10)*. Association for Computing Machinery, New York, NY, USA, 127–130. https://doi.org/10.1145/1718918.1718942

[3] Rachel Barken and Ruth Lowndes. 2018. Supporting family involvement in long-term residential care: Promising practices for relational care. *Qualitative health research* 28, 1 (2018), 60–72.

[4] Caroline Bell, Cara Fausset, Sarah Farmer, Julie Nguyen, Linda Harley, and W. Bradley Fain. 2013. Examining Social Media Use among Older Adults. In *Proceedings of the 24th ACM Conference on Hypertext and Social Media (HT '13)*. Association for Computing Machinery, New York, NY, USA, 158–163. https://doi.org/10.1145/2481492.2481509

[5] Cynthia L Bennett, Daniela K Rosner, and Alex S Taylor. 2020. The Care Work of Access. In *CHI*. 1–15. https://doi.org/10.1145/3313831.3376568

[6] Marc Berg. 1999. Patient care information systems and health care work: a sociotechnical approach. *International journal of medical informatics* 55, 2 (1999), 87–101.

[7] Suzy Braye. 1995. *Empowering practice in social care*. McGraw-Hill Education (UK).

[8] Robin N. Brewer and Anne Marie Piper. 2016. "Tell It Like It Really Is": A Case of Online Content Creation and Sharing Among Older Adult Bloggers. In *Proceedings of CHI 16*. https://doi.org/10.1145/2858036.2858379

[9] Robin N Brewer and Anne Marie Piper. 2017. xPress : Rethinking Design for Aging and Accessibility through a Voice-based Online Blogging Community. *PACM HCI* 1, 2 (2017). https://doi.org/10.1145/3139354

[10] Helen MacKenzie Bryers and Edwin Van Teijlingen. 2010. Risk, theory, social and medical models: a critical analysis of the concept of risk in maternity care. *Midwifery* 26, 5 (2010), 488–496.

[11] Moira Burke, Lada Adamic, and Karyn Marciniak. 2013. Families on facebook. In *Seventh International AAAI Conference on Weblogs and Social Media*.

[12] Moira Burke, Robert Kraut, and Cameron Marlow. 2011. Social capital on Facebook: Differentiating uses and users. In *Proceedings of the SIGCHI conference on human factors in computing systems*. 571–580.

[13] Moira Burke, Cameron Marlow, and Thomas Lento. 2010. Social network activity and social well-being. In *Proceedings of the SIGCHI conference on human factors in computing systems*. 1909–1912.

[14] Judith Campbell and Jocelyn Handy. 2011. Bound to care: Custodial grandmothers' experiences of double bind family relationships. *Feminism & Psychology* 21, 3 (2011), 431–439.

[15] Laura L Carstensen, Derek M Isaacowitz, and Susan T Charles. 1999. Taking time seriously: A theory of socioemotional selectivity. *American psychologist* 54, 3 (1999), 165.

[16] Pamara F Chang, Yoon Hyung Choi, Natalya N Bazarova, and Corinna E Löckenhoff. 2015. Age differences in online social networking: Extending socioemotional selectivity theory to social network sites. *Journal of Broadcasting & Electronic Media* 59, 2 (2015), 221–239.

[17] Erie Chapman. 2003. *Radical loving care: Building the healing hospital in America*. Baptist Healing Hospital Trust.

[18] Yunan Chen, Victor Ngo, and Sun Young Park. 2013. Caring for Caregivers: Designing for Integrality. In *Proceedings of the 2013 Conference on Computer Supported Cooperative Work (CSCW '13)*. Association for Computing Machinery, New York, NY, USA, 91–102. https://doi.org/10.1145/2441776.2441789

[19] Sylvia Clavan. 1978. The impact of social class and social trends on the role of grandparent. *Family Coordinator* (1978), 351–357.

[20] Davina Cooper. 2007. Well, you go there to get off' Visiting feminist care ethics through a women's bathhouse. *Feminist Theory* 8, 3 (2007), 243–262.

[21] Kate Crawford. 2011. Listening, not lurking: The neglected form of participation. *Cultures of participation* (2011), 63–74.

[22] Tamara Daly and Marta Szebehely. 2012. Unheard voices, unmapped terrain: Care work in long-term residential care for older people in Canada and Sweden. *International Journal of Social Welfare* 21, 2 (2012), 139–148.

[23] María Puig de la Bellacasa. 2012. 'Nothing comes without its world': thinking with care. *The Sociological Review* 60, 2 (2012), 197–216.

[24] Nicole B Ellison, Penny Triu, Sarita Schoenebeck, Robin Brewer, and Aarti Israni. 2020. Why We Don't Click: Interrogating the Relationship Between Viewing and Clicking in Social Media Contexts by Exploring the "Non-Click". *Journal of Computer-Mediated Communication* 25, 6 (2020), 402–426.

[25] Nicole B Ellison, Jessica Vitak, Rebecca Gray, and Cliff Lampe. 2014. Cultivating social resources on social network sites: Facebook relationship maintenance behaviors and their role in social capital processes. *Journal of Computer-Mediated Communication* 19, 4 (2014), 855–870.

[26] Berenice Fisher and Joan Tronto. 1990. Toward a feminist theory of caring. *Circles of care: Work and identity in women's lives* (1990), 35–62.

[27] Anna K Forsman, Johanna Nordmyr, Tihana Matosevic, A-La Park, Kristian Wahlbeck, and David McDaid. 2018. Promoting mental wellbeing among older people: technology-based interventions. *Health promotion international* 33, 6 (2018), 1042–1054.

[28] Anna K Forsman, Johanna Nordmyr, and Kristian Wahlbeck. 2011. Psychosocial interventions for the promotion of mental health and the prevention of depression among older adults. *Health promotion international* 26, suppl_1 (2011), i85–i107.

[29] Mary P Gallant and Cathleen M Connell. 1997. Predictors of decreased self-care among spouse caregivers of older adults with dementing illnesses. *Journal of Aging and Health* 9, 3 (1997), 373–395.

[30] Catherine Grevet, Loren G. Terveen, and Eric Gilbert. 2014. Managing Political Differences in Social Media. In *Proceedings of the 17th ACM Conference on Computer Supported Cooperative Work Social Computing (CSCW '14)*. Association for Computing Machinery, New York, NY, USA, 1400–1408. https://doi.org/10.1145/2531602.2531676

[31] Keith N Hampton, Lauren Sessions Goulet, Lee Rainie, and Kristen Purcell. 2011. *Social networking sites and our lives*. Vol. 1. Pew Internet & American Life Project Washington, DC.

[32] Hi'ilei Julia Kawehipuaakahaopulani Hobart and Tamara Kneese. 2020. Radical Care: Survival Strategies for Uncertain Times. *Social Text* 38, 1 (2020), 1–16. https://doi.org/10.1215/01642472-7971067

[33] Alexis Hope, Ted Schwaba, and Anne Marie Piper. 2014. Understanding digital and material social communications for older adults. In *Proceedings of the 32nd annual ACM conference on Human factors in computing systems*. ACM Press, New York, New York, USA, 3903–3912. https://doi.org/10.1145/2556288.2557133

[34] Maarten Houben, Benjamin Lehn, Noa van den Brink, Sabeth Diks, Jasmijn Verhoef, and Rens Brankaert. 2020. Turnaround: Exploring Care Relations in Dementia Through Design. In *Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems (CHI EA '20)*. Association for Computing Machinery, New York, NY, USA, 1–8. https://doi.org/10.1145/3334480.3382846

[35] S Mo Jang, Hoon Lee, and Yong Jin Park. 2014. The more friends, the less political talk? Predictors of Facebook discussions among college students. *Cyberpsychology, Behavior, and Social Networking* 17, 5 (2014), 271–275.

[36] Peter Jones. 2013. *Design for care: Innovating healthcare experience*. Rosenfeld Media.

[37] Eun Hwa Jung, Justin Walden, Ariel Celeste Johnson, and S Shyam Sundar. 2017. Social networking in the aging context: Why older adults use or avoid Facebook. *Telematics and Informatics* 34, 7 (2017), 1071–1080.

[38] Tomoko Kanayama. 2003. Ethnographic research on the experience of Japanese elderly people online. *New Media & Society* 5, 2 (2003), 267–288.

[39] Amanda Lazar, Caroline Edasis, and Anne Marie Piper. 2017. Supporting People with Dementia in Digital Social Sharing. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems (CHI '17)*. Association for Computing Machinery, New York, NY, USA, 2149–2162. https://doi.org/10.1145/3025453.3025586

[40] Vilma Lehtinen, Jaana Näsänen, and Risto Sarvas. 2009. "A Little Silly and Empty-Headed"–Older Adults' Understandings of Social Networking Sites. *People and Computers XXIII Celebrating People and Technology* (2009), 45–54.

[41] Siân E. Lindley. 2011. Shades of lightweight: supporting cross-generational communication through home messaging. *Universal Access in the Information Society* 11, 1 (jun 2011), 31–43. https://doi.org/10.1007/s10209-011-0231-2

[42] Siân E Lindley, Richard Harper, and Abigail Sellen. 2008. Designing for Elders : Exploring the Complexity of Relationships in Later Life. In *BCS-HCi*. 77–86.
[43] Siân E Lindley, Richard Harper, and Abigail Sellen. 2009. Desiring to be in touch in a changing communications landscape: attitudes of older adults. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. 1693–1702.
[44] Nora McDonald, Sarita Schoenebeck, and Andrea Forte. 2019. Reliability and Inter-rater Reliability in Qualitative Research: Norms and Guidelines for CSCW and HCI Practice. *Proceedings of the ACM on Human-Computer Interaction* 3, CSCW (2019), 1–23.
[45] Galit Nimrod. 2011. The fun culture in seniors' online communities. *The Gerontologist* 51, 2 (2011), 226–237.
[46] Blair Nonnecke, Dorine Andrews, and Jenny Preece. 2006. Non-public and public online community participation: Needs, attitudes and behavior. *Electronic Commerce Research* 6, 1 (jan 2006), 7–20. https://doi.org/10.1007/s10660-006-5985-x
[47] Blair Nonnecke and Jenny Preece. 2000. Lurker demographics: Counting the silent. In *Proceedings of the SIGCHI conference on Human Factors in Computing Systems*. 73–80.
[48] Chris Norval, John L. Arnott, and Vicki L. Hanson. 2014. What's on Your Mind? Investigating Recommendations for Inclusive Social Networking and Older Adults. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '14)*. Association for Computing Machinery, New York, NY, USA, 3923–3932. https://doi.org/10.1145/2556288.2556992
[49] Candice L Odgers and Michaeline R Jensen. 2020. Annual Research Review: Adolescent mental health in the digital age: facts, fears, and future directions. *Journal of Child Psychology and Psychiatry* 61, 3 (2020), 336–348.
[50] Amy Orben. 2020. Teenagers, screens and social media: a narrative review of reviews and key studies. *Social psychiatry and psychiatric epidemiology* (2020), 1–8.
[51] Caroline Criado Perez. 2019. *Invisible Women: Exposing data bias in a world designed for men*. Random House.
[52] Andrew Perrin. 2015. *Social Media Usage: 2005-2015*. Technical Report. Pew Research Center. http://www.pewinternet.org/2015/10/08/social-networking-usage-2005-2015
[53] Andrew Perrin. 2018. Americans are changing their relationship with Facebook. *Pew Research Center* 5 (2018).
[54] Martin Pinquart and Silvia Sörensen. 2011. Spouses, adult children, and children-in-law as caregivers of older adults: a meta-analytic comparison. *Psychology and aging* 26, 1 (2011), 1.
[55] Anne Marie Piper, Raymundo Cornejo, Lisa Hurwitz, and Caitlin Unumb. 2016. Technological Caregiving: Supporting Online Activity for Adults with Cognitive Impairments. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems (CHI '16)*. Association for Computing Machinery, New York, NY, USA, 5311–5323. https://doi.org/10.1145/2858036.2858260
[56] Anabel Quan-Haase and Isioma Elueze. 2018. Revisiting the Privacy Paradox: Concerns and Protection Strategies in the Social Media Experiences of Older Adults. In *Proceedings of the 9th International Conference on Social Media and Society (SMSociety '18)*. Association for Computing Machinery, New York, NY, USA, 150–159. https://doi.org/10.1145/3217804.3217907
[57] Yasmeen Rashidi, Apu Kapadia, Christena Nippert-Eng, and Norman Makoto Su. 2020. "It's Easier than Causing Confrontation": Sanctioning Strategies to Maintain Social Norms and Privacy on Social Media. *Proc. ACM Hum.-Comput. Interact.* 4, CSCW1, Article 023 (May 2020), 25 pages. https://doi.org/10.1145/3392827
[58] Arlind Reuter, Tom Bartindale, Kellie Morrissey, Thomas Scharf, and Jennifer Liddle. 2019. Older voices: supporting community radio production for civic participation in later life. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*. 1–13.
[59] Fiona Robinson. 2011. The ethics of care: A feminist approach to human security. (2011).
[60] Yvonne Rogers, Jeni Paay, Margot Brereton, Kate L Vaisutis, Gary Marsden, and Frank Vetere. 2014. Never too old: engaging retired people inventing the future with MaKey MaKey. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. 3913–3922.
[61] Karen D Scheib. 2004. *Challenging Invisibility: Practices of Care*. Chalice Press.
[62] Marén Schorch, Lin Wan, David William Randall, and Volker Wulf. 2016. Designing for Those Who Are Overlooked: Insider Perspectives on Care Practices and Cooperative Work of Elderly Informal Caregivers. In *Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work Social Computing (CSCW '16)*. Association for Computing Machinery, New York, NY, USA, 787–799. https://doi.org/10.1145/2818048.2819999
[63] Amanda K Sesko and Monica Biernat. 2010. Prototypes of race and gender: The invisibility of Black women. *Journal of Experimental Social Psychology* 46, 2 (2010), 356–360.
[64] Elizabeth Stowell, Yixuan Zhang, Carmen Castaneda-Sceppa, Margie Lachman, and Andrea G. Parker. 2019. Caring for Alzheimer's Disease Caregivers: A Qualitative Study Investigating Opportunities for Exergame Innovation. *Proc. ACM Hum.-Comput. Interact.* 3, CSCW, Article 130 (Nov. 2019), 27 pages. https://doi.org/10.1145/3359232
[65] Matthieu Tixier and Myriam Lewkowicz. 2016. "Counting on the Group": Reconciling Online and Offline Social Support among Older Informal Caregivers. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems (CHI*

'16). Association for Computing Machinery, New York, NY, USA, 3545–3558. https://doi.org/10.1145/2858036.2858477

[66] Austin Toombs, Shad Gross, Shaowen Bardzell, and Jeffrey Bardzell. 2017. From empathy to care: a feminist care ethics perspective on long-term researcher–participant relations. *Interacting with Computers* 29, 1 (2017), 45–57.

[67] Austin L. Toombs, Andy Dow, John Vines, Barbara Dennis, Rachel Clarke, Ann Light, and Colin M. Gray. 2018. Designing for everyday care in communities. *DIS 2018 - Companion Publication of the 2018 Designing Interactive Systems Conference* (2018), 391–394. https://doi.org/10.1145/3197391.3197394

[68] Joan C Tronto. 2018. Care as a political concept. In *Revisioning the political: Feminist reconstructions of traditional concepts in western political theory*. Taylor and Francis, 139–156.

[69] Sonja Utz. 2015. The function of self-disclosure on social network sites: Not only intimate, but also positive and entertaining self-disclosures increase the feeling of connection. *Computers in Human Behavior* 45 (2015), 1–10.

[70] Cornelia van Uden-Kraan, Constance Drossaert, Erik Taal, Erwin Seydel, and Mart van de Laar. 2008. Self-reported differences in empowerment between lurkers and posters in online patient support groups. *Journal of medical internet research* 10, 2 (2008), e18.

[71] Eduardo Velloso. [n.d.]. How eye tracking gives players a new experience in video games. ([n. d.]). https://theconversation.com/how-eye-tracking-gives-players-a-new-experience-in-video-games-54595

[72] Philippe Verduyn, David Seungjae Lee, Jiyoung Park, Holly Shablack, Ariana Orvell, Joseph Bayer, Oscar Ybarra, John Jonides, and Ethan Kross. 2015. Passive Facebook usage undermines affective well-being: Experimental and longitudinal evidence. *Journal of Experimental Psychology: General* 144, 2 (2015), 480.

[73] Philippe Verduyn, Oscar Ybarra, Maxime Résibois, John Jonides, and Ethan Kross. 2017. Do social network sites enhance or undermine subjective well-being? A critical review. *Social Issues and Policy Review* 11, 1 (2017), 274–302.

[74] Jessica Vitak, Nicole B Ellison, and Charles Steinfield. 2011. The ties that bond: Re-examining the relationship between Facebook use and bonding social capital. In *2011 44th Hawaii International Conference on System Sciences*. IEEE, 1–10.

[75] Jenny Waycott, Frank Vetere, Sonja Pedell, Lars Kulik, Elizabeth Ozanne, Alan Gruner, and John Downs. 2013. Older adults as digital content producers. In *Proceedings of the SIGCHI conference on human factors in computing systems*. 39–48.

[76] Donghee Yvette Wohn, Caleb T Carr, and Rebecca A Hayes. 2016. How affective is a "Like"?: The effect of paralinguistic digital affordances on perceived social support. *Cyberpsychology, Behavior, and Social Networking* 19, 9 (2016), 562–566.

[77] Loreen Wolfer. 2017. No sex, cursing and politics: Adult views of inappropriate Facebook posts. *Journal of Human Values* 23, 2 (2017), 116–128.

Received June 2020; revised October 2020; accepted December 2020