

Master's Thesis

Fake news, digital inequality, and the aging population

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Abstract

Online fake news has garnered significant research attention since emerging as a hot-button issue during the 2016 United States presidential election cycle. New studies suggest this digital threat disproportionately burdens older adult digital media consumers and hinders population health. Based on literature research and interviews with key informants, this thesis argues that older adult fake news susceptibility is a public health problem symptomatic of an age-based digital divide.

I begin by reviewing emerging research showing heightened fake news susceptibility and exposure in older adults. Next, I evaluate the role of age bias in research, policy, and public discourse surrounding online false information. I will then highlight the budding research on the adverse individual and societal health effects associated with fake news to assert that this is a public health issue comparable to online fraud and digital inequality.

I conclude by evaluating fake news interventions grouped into three categories: 1) Research, 2) Regulation, and 3) Empowerment. Using a public health framework, I analyze existing interventions and propose recommendations to curb fake news and empower older adult digital media consumers in the post-truth era.

Specific Aims:

1. To examine the state of research on online false information and older adult health.
 - a. What are the driving factors for heightened fake news susceptibility and exposure in older adults?
 - b. What are the public health implications of the age-fake news relationship?
2. To explore interventions relating to fake news and older adults.
 - a. What existing interventions target fake news or related issues in older adults and other populations?
 - b. What interventions are recommended by experts?

Background and Significance

Seniors are consuming more digital media than ever as they engage in an increasingly fast-paced 24-hour news cycle. Three-in-10 Americans ages 65 and older report often getting news online (Gottfried & Shearer, 2017) while 37% use social media sites (Smith & Anderson, 2018). Though television remains the preferred platform, digital media has become a staple of the older adult news diet (“The Nielsen Total Audience Report,” 2018).

Digital media can enhance the lives of older adults by increasing independence and facilitating interpersonal relationships (Chopik, 2016), but it can also hamper health by heightening exposure to fake news and other online threats. Evidence is mounting that older Americans are more vulnerable to false information online because of inequalities in information and communication technologies (ICT) as well as cognitive effects of aging. Furthermore, new research shows that fake news exposure can adversely affect individual and population health by increasing stress, stirring violence, justifying discriminatory policy, and eroding institutional trust (Walton, 2018; Lara-Cabrera et al., 2017; Speed & Mannion, 2017; Iyengar & Massey, 2018). Considered together, these findings have significant public health implications; fake news not only threatens older adult digital media consumers but creates immense social burdens.

This thesis lays the predicate for evaluating online fake news in older adults as a public health problem. Though the issue has garnered significant attention since the 2016 U.S. election, there is scarce research focused on older Americans. This review aims to fill this void by synthesizing academic literature across disciplines and conducting interviews with key informants from diverse backgrounds. Based on literature research and interviews, I argue that older adult fake news susceptibility is a public health problem symptomatic of an age-related digital divide. The potentially dire public health damage inflicted by online false information warrants a public health response that considers individual autonomy while weighing the structural factors driving the digital divide.

An important caveat: This review uses “older adults,” “seniors,” and “older Americans” interchangeably in reference to Americans ages 65 and older. Subpopulation specification (i.e. study populations) is provided when applicable. A wide net is cast due to the paucity of fake news research on older adult subpopulations. Nevertheless, older Americans are highly heterogeneous and differences within this group (including age, race, ethnicity, nationality, socioeconomic status, gender, language, education) should be considered. Findings from this

literature review should serve not as a panacea for the problem of fake news and older adult health, but as a guideline for future research and interventions.

Methods

This review synthesizes information gathered through literature research and interviews with key informants. The literature consists of academic and media reports obtained through online databases and search engines including PubMed, Ovid, Google Scholar, and Google. Search terms included but were not limited to fake news, digital disinformation, digital misinformation, older adults, aging, elderly, digital divide, ICT literacy, digital literacy, and technological literacy.

The paper draws on interviews with key informants representing different disciplines, including information literacy, aging, online media, politics, and cognitive psychology. Informants provided clarity on published research and grey literature while offering insights on the issue at large. Interviews were foundational for this review's discussion and concluding recommendations aiming to protect and empower older adults in an increasingly perilous digital information age. Key informants were selected based on relevance of work and academic research. They were contacted by email and invited to participate in phone or in-person interviews. Contact emails included a brief summary of the thesis research question and the topics to be discussed in the interview. Informants were informed before the interview that any quotations attributed by name would require their consent. Following the interviews, informants were emailed quotations and requested to provide consent. Of the 11 individuals or organizations contacted, nine responded and seven participated in interviews. Two respondents did not respond to emails, one declined, and one responded but did not participate. The research protocol was submitted to Columbia University's Human Research Protection Office and granted exemption under "Educational Testing, Survey or Observational Research."

Key terminology

This thesis focuses on fake news and related concepts including disinformation, misinformation, and post-truth. These terms are distinguishable in small but important ways. Fake news, used interchangeably with false information, refers to "news articles that are intentionally and verifiably false, and could mislead readers" (Allcott, 2017). Disinformation

refers to “deliberately misleading or biased information,” and digital disinformation refers to disinformation spread online (Dictionary.com). Misinformation differs from disinformation in that it is false information spread irrespective of intent (“Dictionary.com’s 2018 Word,” 2018). Post-truth describes circumstances in which objectivity is less influential in shaping public opinion (“Word of the Year,” 2016).

Other recurring terminologies involve technology and literacy. The digital divide refers to uneven access, use, or impact of information and communication technologies (ICT). ICT literacy and ICT proficiency refer to the ability to use digital technology, communication tools, and/or networks (Educational Testing Service, 2003). Media literacy is an individual’s ability to access, analyze, and evaluate media (Aufderheide, 1993), while digital literacy applies to media from the internet (“What Is Digital,” 2017). Information literacy is the ability to think critically and make balanced judgements about any information that can be found and used (Coonan et al., 2018). Technology literacy is “The ability to responsibly use appropriate technology ... to improve learning in all subject areas and to acquire lifelong knowledge and skills in the 21st century” (SETDA, 2017).

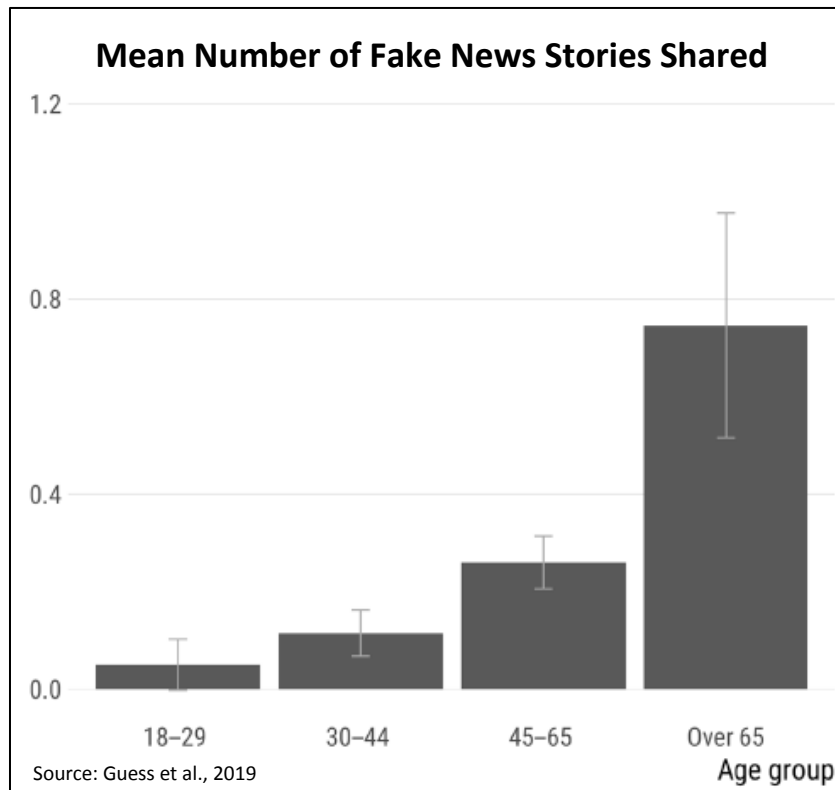
Interpretations of these terms can vary. Perceptions of fake news, for example, can differ based on an individual’s biases or political leanings. Disinformation, moreover, may be operationalized differently across studies depending on researcher preferences. Unless stated otherwise, however, these terms will refer to their stated definitions.

Blame the baby boomers?

In January 2019, researchers from Princeton University and New York University published a study showing that seniors fell for fake news more than their younger counterparts (Guess, Nagler, & Tucker, 2019). The *Science Advances* paper corroborated conventional wisdom of the Millennials and Generation Xers who dominate digital media discourse. Within hours of publication, the study spread to online media outlets which quipped that baby boomers and grandparents were to blame for the rise of fake news. (Stewart, 2019; Stillman, 2019)

Fake news is an age-old problem, but is it exceptionally problematic for people in old age? Anecdotes and aging stereotypes have shaped hypotheses, but the question remains largely unexplored in academic literature. Only recently have researchers turned attention to older adults and fake news — in the case of Guess et al. (2019), unintentionally.

Andy Guess, a Princeton professor of politics and public affairs who co-authored the paper, expected ideology and partisanship to emerge as predictors of fake news dissemination. The study monitored sharing activity of 3,500 Facebook users during the 2016 U.S. election campaign and used a list of fake news sites – domains knowingly purveying false or misleading content to generate ad revenue such as the “Denver Guardian,” and “abcnews.com.co.” As the researchers anticipated, data showed conservatives were more likely to share fake news. But the more puzzling finding was the independent role of age. Controlling for ideology and party identification, older adults were far more likely to share fake news than younger age groups. Facebook users age 65 and older shared almost seven times as many fake news articles as users ages 30 to 44.



The Guess et al. (2019) findings jibe with emerging research on age differences in digital media literacy. A 2018 Pew survey asked respondents to categorize five factual statements such as “President Barack Obama was born in the United States” and five opinion statements such as “Abortion should be legal in most cases” (Gottfried & Grieco, 2018). Individuals ages 18-49 correctly identified all five factual statements (32%) at higher rates than the 50 and older group (20%), and correctly identified all five opinion statements (44%) better than their older

counterparts (26%). Pew research found that 23% of respondents reported sharing a made-up news story, with 64% saying fabricated news stories cause a great deal of confusion (Anderson & Rainie, 2017). A large-scale survey conducted by Ipsos and BuzzFeed News found that fake news headlines fooled American adults 75% of the time (Silverman, 2016).

The cause of the age-fake news relationship is unclear but Guess et al. (2019) offered several possible explanations. First, lower levels of digital media literacy in seniors may heighten their susceptibility to fake news dissemination. Second, deteriorating memory associated with aging could undermine ability to resist misinformation and disinformation. Third, an omitted variable could bias the results; In an interview, Guess speculated the prevalence of fake news exposure within user Facebook feeds – unexamined in this research – could be associated with the number of fake news stories shared. This explanation aligns with evidence suggesting seniors are more frequently targeted. Jestin Coler, who ran popular fake news sites such as USAToday.com.co and WashingtonPost.com.co, told BuzzFeed News that older people were a key demographic because they were more likely to share fake news especially on Facebook (Silverman, 2019). Older Americans tend to be more engaged on political issues and are targeted by hyperpartisan Facebook pages (Silverman, 2019). Turning Point USA, a non-profit conservative group targeting college students, was until recently receiving most of its engagement from older adults. In a digital media ecosystem where clicks are currency, a viral fake news article can drive web traffic and generate significant ad revenue. Seniors are likely to remain targets given the marked increase in the influence of dark money funds sponsoring trolls and bots to circulate disinformation and misinformation (Iyengar & Massey, 2018). A casual internet user's lack of awareness and vulnerability can be manipulated and exploited by those with incentives to gain profit and power gained through the spread of false information.

New findings on older adult fake news susceptibility are consistent with the rich literature detailing age differences in ICT proficiency. Still, the age-fake news relationship remains largely unexplored in academic literature. As with Guess et al. (2019), most fake news studies lack causal evidence explaining its increased prevalence in older adults. Additional quantitative and qualitative research can offer a better understanding of the causes, mechanisms, and ramifications of the relationship.

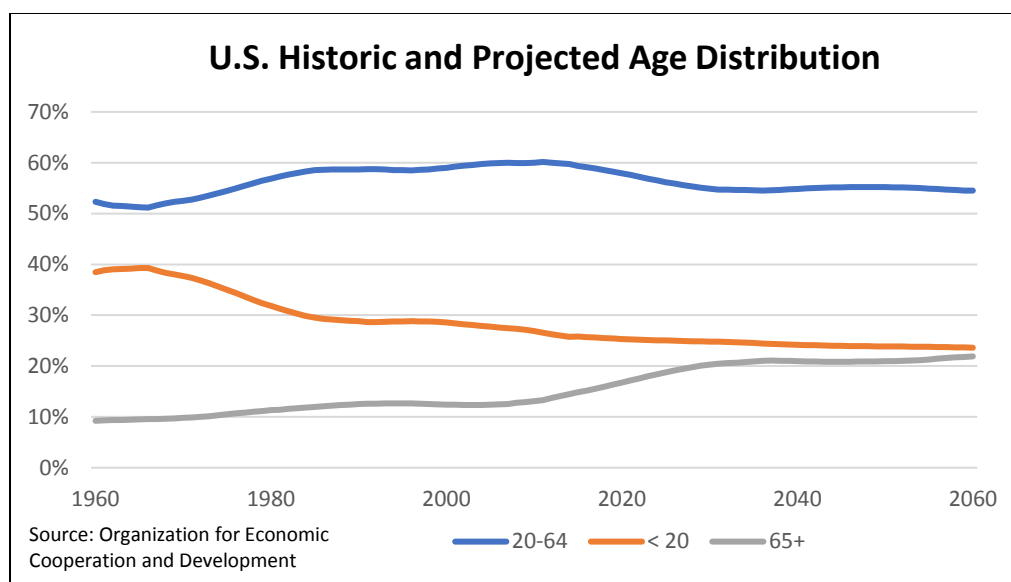
“What we’ve been able to do is sort of establish that this pattern did exist,” Guess said. “So now the frontier is looking at what’s going on in the individual level.”

Left to their own devices

Nicole Lee's research focuses on science communication and digital media. When contacted for an interview, the North Carolina State professor cautioned that aging is outside her area of expertise. Nonetheless, that outsider perspective may have been the key to helping Lee identify a gaping void in fake news literature. While conducting separate research on misinformation, Lee noticed that the literature disproportionately focused on children and younger adults. Lee and other researchers speculate this imbalance stems from limitations inherent in education and literacy research. Whereas the classroom serves as a natural laboratory to examine instructional interventions, there is no such universal setting for older adults. The result is an age imbalance in fake news research that may ultimately impede development of digital and technological literacy programs for older adults. In 2018, Lee penned an article *Communication Education* bringing attention to this imbalance, calling for research on digital media literacy education to move beyond the classroom and toward adult populations (Lee, 2019).

"Why I care and why you care is that fake news and these other types of fraud targeting older adults is a problem and it's not going to stop," Lee said in an interview. "And we can't keep people from doing it. So, the only way to keep it from hurting people is to focus on the audience side. It is important work."

In the U.S. and abroad, the amount of attention devoted to older people remains disproportionate to the challenges they face and the impact that they have (Raycheva, Miteva, & Peicheva, 2018). Older Americans are the nation's fastest growing age demographic, accounting for 16% of the population and an estimated 20% by 2030 (Organization for Economic Cooperation and Development). Age is increasing within the older adult group, with the 80-plus group (24% of older Americans in 2019) projected to account for more than a third of older Americans by 2040. Older Americans not only have strength in numbers; they play an outsized role in civic life as they are more likely to vote, make political contributions, and wield economic power (Silverman, 2019). Nevertheless, older adults are often overlooked and neglected in research, policy, and public discourse.



The age gap is especially apparent in information and communication technology (ICT). Research has consistently shown age-related disparities ICT literacy. A Pew survey found that 34% of older internet users say they have little to no confidence in their ability to use electronic devices to perform online tasks (Anderson & Perrin, 2017). While funding for digital literacy has skyrocketed since the 2016 election (Silverman, 2019), most programs are designed for younger demographics and not digital immigrants – individuals born before the widespread use of technology. In a perilous digital media ecosystem that targets vulnerable individuals, older adults are being left to their own devices.

Though widely attributed to internal factors such as technophobia and digital illiteracy (Neves, Waycott, & Malta, 2019), ICT literacy gaps stem from external, structural factors driven by ageism. Defined as “prejudice or discrimination on the grounds of a person’s age,” ageism manifests itself in institutional policies and practices that render older adults invisible (Lenstra, 2017). Public libraries and senior centers, for example, have failed to meet older adult demands for digital literacy. A 2014 study of public libraries in New York City and Atlanta showed that only half of libraries had staff designated to coordinate library services for older adults; a 2017 study found that only 18 percent of rural libraries had designated staff members coordinating older services (Lenstra, 2017). An analysis of senior centers in New York City noted that technology programming frequently flounders due to erratic staffing, inappropriate curriculum, technology programming, poor funding, and limited capacity. Inadequate public library and senior centers deprive older adults of vital technological services and support.

Ageism also manifests in age biases inherent in technological design. Research has found that many forms of technology are not developed with consideration to the perceptual and cognitive abilities for older consumers (Boot et al., 2018). Software catering to seniors can reduce promote technology use in this age group. A study exploring video game use, Boot et al. (2018) found that older adults became active gamers when granted access to games not demanding fast reactions such as puzzles, strategy and educational games.

Lastly, ageism can play a role in widening the digital divide by reducing older adult ICT proficiency through a self-fulfilling prophecy effect. Individuals who internalize perceptions about their inability to use internet technology have reduced self-efficacy (McDonough, 2016). A 2015 study examining individuals from Quebec from ages 50-90+ found that individuals endorsing ageist stereotypes (e.g. alleging inability to learn new things) were less likely to use ICT (Lagacé, Laplante, Charmarkeh, & Tanguay, 2015). Research on minority stress in lesbian, gay men, and bisexuals (LGBs) has shown that heightened focus on marginalized groups can result in increased stress and divert attention from structural causes (Meyer, 2003). Incidentally, spotlighting older adults in fake news discourse can place undue burdens on the victims rather than perpetrators and societal forces. Already impeded by limited resources and programming, seniors are hampered by ageist stereotypes that curb ICT literacy. Ready or not, these individuals are thrust into a ubiquitous digital world and tasked with navigating the online media minefield. Ageism is thus worthy of scrutinization as a causal factor and an effect modifier in the age-fake news relationship.

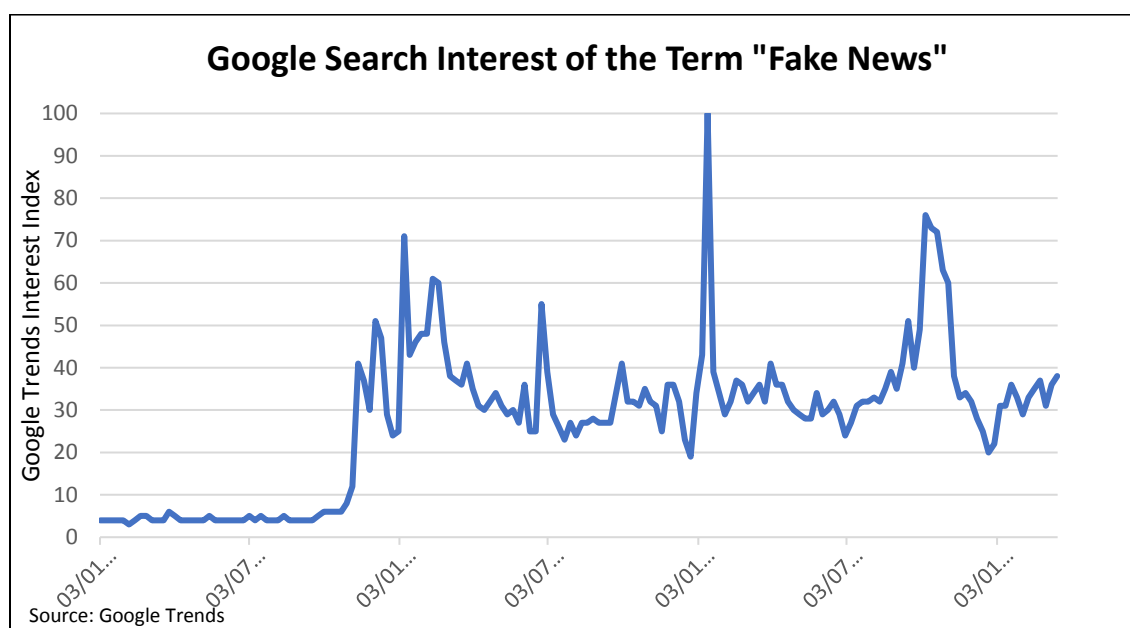
Online Fake News: A Public Health Problem?

More than 2,000 years ago in Ancient Rome, a young Octavian sought to turn the public against rival Marcus Antonius by circulating his purportedly fabricated will (MacDonald, 2017). In 1782, Benjamin Franklin created a fake issue of a real Boston newspaper featuring a bogus story claiming wartime atrocities committed by Indians at the order of King George. Copies of that newspaper were sent to cities across the U.S. to sway public opinion against Britain (Parkinson, 2016). If fake news has contaminated information pathways for millennia, why now should it be recognized as a public health concern?

The World Health Organization defines public health as “the art and science of preventing disease, prolonging life and promoting health through the organized efforts of

society” (Acheson, 1988). Fake news damages societal health by stirring violence, justifying discriminatory policy, and eroding institutional trust. Further, it hinders individual well-being by exposing digital media consumers to misleading health information, increased stress, and exploitation. In older adults – more vulnerable to digital deception and wielding outsized electoral and economic influence (Silverman, 2019) – these negative effects may be amplified. As such, fake news should be considered a public health threat impacting older adults and society at large.

The rise of online false information stems from decades of growing political polarization combined with the emergence of self-reinforcing online networks, experts say (Mihailidis & Viotty, 2017). In recent years, fake news has penetrated public discourse. Analysis of Google Trends data shows that fake news emerged during the 2016 election cycle which saw the political weaponization of online misinformation and disinformation. The issue has since been subject to scrutiny in media and academia.



Though online fake news shares similarities to its print-based antecedents, the manner of its dissemination is unprecedented. Abetted by technological advancements, digital disinformation and misinformation can travel the globe in seconds; everyone with smartphones, tablets, computers, and other electronic devices can be exposed. The proliferation of blogs, opinion websites, and other hyper-focused platforms (Iyengar & Massey, 2018) has led to individuals spending more time in homophilous networks often barren of opposing views

(Mihailidis & Viotty, 2017). “In online spaces, people curate their own information and realities,” said Paul Mihailidis, an Emory journalism professor specializing in media literacy.

Social media sites have morphed into fake news havens that enable online bad actors to reach large audiences (Hunt, Robertson, & Pow, 2018). In 2018, six of Facebook’s 15 most commented articles were fake news, including four stories alleging New York legalized abortion up to birth, according to data from the social media tracking company NewsWhip (Owen, 2019). On Facebook, where adults 55-plus are the projected second-largest age group (Sweeney, 2018), 60 million of the 2 billion regular visitors in 2017 were fake accounts. On the younger-leaning Twitter, an estimated 9% to 15% accounts were fake (Yang et al., 2019). During the final three months of the 2016 U.S. presidential election cycle, the top-performing fake election news stories generated more Facebook engagement than news stories from reputable media outlets, (Silverman, 2016). Leaders across the globe have expressed concern over the rise of fake news. In a news conference in Berlin following the 2016 U.S. presidential election, then President Barack Obama stood alongside German chancellor Angela Merkel and denounced fake news as a threat to “democratic freedoms and market-based economies and prosperity” (Harris & Eddy, 2016).

Social media environments can radicalize individuals and trigger offline violence and terrorism (Lara-Cabrera et al., 2017). The “Pizzagate” conspiracy theory is a cautionary tale. On October 30, 2016, a Twitter account presenting itself as a lawyer claimed the New York City Police Department discovered a pedophilia ring connected with the Democratic Party. Within days the fabricated claim spread to message boards, Turkish pro-government media outlets, and alt-right activists as it morphed into a conspiracy theory about a D.C. pizza restaurant being used as a front for a child sex ring. That December, a 28-year-old man entered the restaurant and fired three shots with an AR-15, later claiming that he was investigating the scene (Siddiqui & Svrluga, 2016). Pizzagate is exceptional for its virality but hardly the only story of its kind. In the October 2018 Pittsburgh synagogue shooting, the gunman posted an anti-Semitic conspiracy theory on the pro-hate-speech social-media site Gab minutes before opening fire (Lind, 2018). False information spread on social media has been linked to violence and the rise of populist movements worldwide (Barberá, 2018; Taub & Fisher, 2018).

The extent of fake news’ direct influence on recent election outcomes is unclear (Allcott, 2018; Neudert, 2018), but there is substantial evidence that it can incite fear in the electorate and

empower demagogues (Speed & Mannion, 2017). Fearmongering fake news can have significant policy implications. For example, U.S. President Donald Trump has regularly used social media to peddle disinformation and misinformation about immigrant populations. The president's dissemination of fake news aimed to rally support for discriminatory policies that can exacerbate health inequalities by limiting healthcare access for marginalized groups.

Fake news stories are not confined to policy and politics. The most viewed fake news stories of 2018 include "Lottery winner arrested for dumping \$200,000 of manure on ex-boss' lawn," "Woman sues Samsung for \$1.8M after cell phone gets stuck inside her vagina," and "BREAKING: Michael Jordan Resigns From The Board at Nike-Takes 'Air Jordans' With Him" (Silverman & Pham, 2018). These fake news stories, while appearing benign, cause cumulative societal damage by sowing confusion and distrust. In an article appearing in the scientific journal PNAS, Iyengar & Massey (2018) noted that the rapid increase in disinformation and misinformation has coincided with waning public confidence in institutions. The resulting "miasma of online confusion" has been especially troublesome for science and health professionals tasked with communicating in an increasingly polarized environment (Iyengar & Massey, 2018).

Though online resources can improve health outcomes, they also expose patients to fallacious and misleading information that hinders well-being. A pilot quantitative study examining medical fake news in Polish language social media classified 40% of the most frequently shared health links as fake news, defined as fabricated news, manipulated news, or advertisement news (Waszak, Kasprzycka-Waszak, & Kubanek, 2018). The most frequently shared link was a fabricated story about a miracle cancer treatment, while other common fake news topics included AIDS and vaccinations. The Polish study's findings corroborated prior research from The Independent noting that health misinformation from conspiracy websites was shared more widely on Facebook than evidence-based health information from reputable news sources (Forster, 2017). Disinformation and misinformation can lead individuals to pursue harmful, non-evidence-based health treatments. For example, companies can use false information to craft narratives manipulating consumers into purchasing their products (Bratu, 2018). Predatory marketing may be especially effective for individuals with lower levels of ICT proficiency and health literacy. The proliferation of health-related fake news can undermine efforts from clinicians and public health professionals alike. For example, false information on

vaccination can reduce immunization rates and lead to disease outbreaks. Anti-vaccination groups who spread misinformation and disinformation contribute to vaccine hesitancy which is considered a global health threat by the World Health Organization (“Ten threats to global health,” 2019). Accepting the inevitability of disinformation and misinformation, researchers recommend organizations develop strategies and online platforms to counteract such threats (Iyengar & Massey, 2018).

Bad for your heart

Geoff Walton is at the forefront of research on fake news and is the principal investigator of a study examining fake news’ physiological effects. But the Manchester Metropolitan University professor’s interest in this field was ignited well before the post-truth era. The son of a coal miner, Walton recalls watching a BBC report that stated miners like his father were earning £20 per week. This was quintessential misinformation; an exaggeration intended to undermine the labor movement, Walton said. Though technically accurate, the reported number reflected the wage across the entire industry, from miners to high-earning senior employees.

Walton views fake news as a societal problem. Just as it manipulated public perception on coal miners, it has stirred up antivaccine sentiment and sparked populist movements worldwide. “It was that kind of [misinformation that] made me realize that this was an issue,” he said. “And then of course Donald Trump came along and the post-truth fake news crystalized it.” Yet, evidence is mounting that it can have deleterious effects on individual health, too. Walton’s current research (expected publication 2019), examines the relationship between fake news exposure, information discernment (ability to accurately assess information), and health. Participants – 18-24-year-old males – were led to believe they could win €100 for another participant if they completed an unsolvable word search. Some participants, however, were fed false information about the other person’s religious views. The study found that the lower information discernment subjects who were misled registered worse cardiovascular and emotional responses than the higher information discernment subjects who were misled. Put differently: fake news may have been bad for their health.

Health professionals speculate that fake news is inflicting physical and psychological damage in media consumers. Since the 2016 U.S. election, numerous media reports have cited clinicians who reported observing upticks in patients in part due to fake news (Clarridge, 2017),

with psychologists speculating that fake news takes a physical and mental toll on media consumers (Kessler, 2019). Though the extent of fake news' psychological toll is unclear, the issue has sparked conversations among mental health professionals about the counselor's role in the post-truth era (Hunt et al., 2018).

A new form of fraud

The younger-leaning digital media ecosystem was fertile ground for Guess et al.'s study on older adult fake news susceptibility to go viral. But it wasn't just the digital news media that took notice. After the study's publication, Guess was contacted by a representative from the AARP, the consumer advocacy group representing older Americans. The AARP representative was interested in the study's findings, and likened fake news to the long-standing problems of scamming and fraud.

In interviews conducted for this thesis, experts speculated that the risk factors predisposing older adults to online fraud and fake news are similar; seniors are targeted because they are perceived as trusting, technologically incompetent, cognitively impaired, wealthy, and less likely to report crimes ("Common Fraud Schemes"). Just as scammers craft fake narratives to exploit older adults financially, fake news purveyors draft fake articles exploiting older adults' digital engagement.

"Actually, [the AARP is] really concerned about this scamming problem in general," Guess said. "To them, these kinds of fake news and online scams are just a subset of a larger kind of scam trying to separate people from their money."

Each year, scammers financially exploit about five million older Americans costing them an estimated \$36.5 billion annually, according to a financial services firm (Leiber, 2018). Many of these scams occur online. In 2016, more cybercrimes (55,043) were committed against older adults (60 years and older) than any other age group (Lee, 2018). Scams not only affect seniors financially; they also hinder health and well-being (Deane, 2018). The U.S. Securities and Exchange Commission categorizes financial exploitation as a form of elder abuse, which is linked with higher risk mortality risk and recognized as a public health issue (Karch & Crosby, 2016).

In recent years online fraud has emerged as a priority for older adult advocates. The AARP, for example, has adapted to the digital age by launching The AARP Fraud Watch

Network (FWN), a resource offering information about online scams (“Scams & Fraud”). In New York state, the “Smart Seniors” program (“A.G. Schneiderman Launches,” 2012) aims to combat elder abuse by helping seniors identify scams and provide them with information to ensure health and safety in their daily lives. A Smart Seniors PDF — buried in the New York State Attorney General’s website’s list of initiatives — provides information about common scams, safety recommendations (i.e. stronger passwords), and fraud resources.

Still, fake news does not appear to be a focus for organizations targeting older adult fraud. Contacted for an interview request, an AARP spokesperson responded by sending a link to the AARP’s FWN. The resource page lists 40 common scams including robocalls, celebrity impostor scams, and tax ID theft, but does not mention fake news. Similarly, fake news does not appear in the Smart Seniors’ 25-page resource.

Fake news has likewise taken a backseat in technology and digital literacy organizations focused on older adults. This is partly because fake news is a new and understudied problem, particularly in older adults. Though major corporations such as Apple and Facebook have partnered with organizations to launch digital literacy initiatives targeting children, older adult initiatives are lagging (Silverman, 2019). There is also concern that older adults could perceive fake news interventions as infringement of liberty. Individuals already hesitant about embracing technology may be steered away altogether if their autonomy is threatened.

Comprehensive digital and technological interventions nonetheless offer valuable foundational skills to help seniors safely navigate online media. Recognizing this, numerous organizations including the AARP have in recent years funded initiatives for ICT literacy in older adult populations. SF Connected, a public entity in San Francisco, offers free digital literacy classes to older adults and adults with disabilities (“SF Connected Program”). Located in public sites across the city, the program teaches basic digital skills (computer, internet, social media) and helps individuals overcome social isolation, build resumes, find jobs, manage personal finances, and improve overall well-being. Though SF Connected has no current training devoted specifically to fake news, it gives special attention to elder abuse and internet safety. “We’re still trying to make sure people navigate the internet safely, navigate the internet intelligently,” said Paulo Salta, program analyst at SF Connected.

Other programs such as the Center for Research and Education on Aging and Technology Enhancement (CREATE) employ similar approaches. Sara Czaja, Director of CREATE, has

devoted decades to helping older adults adopt to technology. For Czaja, digital inequality is a health issue. As technology becomes increasingly ubiquitous in all aspects of society, gaps in access and training can create far-reaching disparities.

One of CREATE's ongoing projects examines PRISM (Personal Reminder Information & Social Management), an easy-to-use software system designed to support social connectivity, memory, knowledge, and overall well-being in older adults (Czaja et al., 2015). Features such as internet, calendars, email, photos, and games can be accessed by a single click, while a classroom feature contains resources such as basic computer training and email etiquette. CREATE is currently evaluating a newer, tablet-friendly PRISM 2.0, which expanded to include additional functions including social media and a classroom module providing information about online scams and fraud, according to Czaja. The findings have been promising. PRISM 2.0's users – people on the other side of the digital divide – experienced enhanced social support and reduced feelings of social isolation. Just as importantly, they also became more technologically proficient and experienced improved attitudes toward technology, Czaja said.

“It's not enough to give someone a tablet. We have to instruct them why it's useful, how to use it, and provide them with technical support,” Czaja said. “Older adults are active users of technology. They're not technophobic, they can learn new things. PRISM has clearly demonstrated that. We had 98-year-olds emailing.”

CREATE and other organizations advocating for older adults serve an integral role in addressing digital inequalities in older Americans. Despite their efforts, online fake news has received insufficient attention in ICT interventions due to age-related gaps in policy and research. Given the aging U.S. population, online fake news poses a significant public health threat that warrants immediate attention through interventions that serve to protect and empower older adult digital media consumers.

Recommendations

Online fake news is a public health issue and there is growing evidence that it disproportionately burdens older Americans. Emerging research suggests that fake news exposure can have deleterious health effects at the individual and societal level. Though evidence on the impact of fake news is far from definitive, there is increasing concern that it is a public health problem. Overstating the extent of the problem could prove counterproductive, but inaction –

neglecting the nation's fastest-growing population – could yield irreversible social consequences that prove far more costly. Public health responses should thus be considered.

This section reviews potential public health solutions which are grouped into three categories: 1) Future age-related fake news research, 2) Fake news regulation, and 3) Empowerment through literacy. The first section contends that ageism is an inherent limitation of present research and provides recommendations for future studies focusing on age and older adults. The second uses a public health framework to justify expanded regulation on digital media corporations while acknowledging the limited feasibility of instituting such measures in an anti-regulatory environment as well as the drawbacks of government interference. The third calls for increased investment toward developing digital, technological, news, and information literacy programs aiming to empower adults and address the root causes of the digital divide.

Research: Exploring causes and pathways

In the summer of 2017, thousands of millennials bought expensive tickets for a luxury music festival widely promoted by celebrity influencers on social networking sites. But the festival was soon exposed as an elaborate scam when it collapsed before it started as detailed in two documentaries: *Fyre: The Greatest Party That Never Happened* and *Fyre Fraud* (Rao, 2019). In media and public discourse, millennials have been lambasted for their social media faux pas. Elements of this narrative have been backed by academic research, including a series of studies conducted by the Stanford History Education Group (2016) that yielded “bleak” findings about digital literacy in children and younger adults. In a study examining civic online reasoning, more than 80% of high school students did not question the source of a post depicting flowers and claiming they had “nuclear birth defects” from Japan's Fukushima Daiichi nuclear disaster. In another study, more than 80% of middle school students were unable to distinguish between real news stories and sponsored content on *Slate* magazine's website.

No age cohort is immune to the ill-effects of false information online. This includes younger people perceived as technologically savvy who have been ridiculed for exhibiting vulnerability to social media scams, as well as older adults perceived as less likely to be technologically proficient and more likely to have cognitive limitations. Though singular studies, news headlines, and anecdotes can offer valuable insights on age differences in fake news consumption and prevalence, they should not by themselves form the basis of sweeping age-

related policy. As experts in aging and literacy acknowledged, online fake news can pose challenges for individuals of all ages and backgrounds.

“There’s so much stuff out there and it’s very hard even for someone who is well educated to wade through it,” Czaja said.

Eschewing ageist assumptions is especially important in research on the nebulous matter of fake news. Well-intentioned studies can transform into media reports that exacerbate ageist stereotypes by characterizing older adults as technophobic and cognitively limited. For example, headlines such as “Fake news? More like ache news. Grandma, grampa 'more likely' to share made-up articles during US election” (Quach, 2019) can shape public discourse and harden existing stereotypes that contribute to a self-fulfilling prophecy effect. Recklessly filling the age-related research gaps can push older adult technology fence sitters away from a digital media environment in which they are underrepresented.

Nonetheless, ignoring the role of aging in fake news susceptibility would do a disservice to the older adult population. A growing body of literature suggests this age group faces heightened vulnerability and exposure to online false information. Rather than dismissing this link, researchers should delve into its causes and pathways beyond chronological age.

The generational cohort effect is particularly worthy of attention in research on fake news susceptibility. Given the rapidly evolving technology landscape, generations have drastically different experiences with online media. For example, individuals entering the older adult cohort in 2019 have different technology experiences than individuals who entered the cohort in 2009. Further, wide variations in generational experiences across cultures and countries (Raycheva et al., 2018) should be considered. Analysis of generational effects could help disentangle the role of shared temporal experiences from that of aging.

Demographic differences within older adults have been understudied in existing research on fake news. Analysis of these differences can improve understanding on exposure and susceptibility to false information. Advice can be heeded from CREATE, which has made a concerted effort to examine diverse, representative populations. The attention to diversity is reflected in CREATE’s PRISM computer program, which upgraded to be available in Spanish after previously on serving English populations. SF Connected, meanwhile, offers digital literacy classes in English, Spanish, Chinese, Russian, and Vietnamese (“SF Connected Program”). In an

increasingly diverse country, multilingual programming can promote inclusion of non-English speaking older adults.

Future research should also pay considerable attention to intersectionality, the interconnected nature of social categorizations. For instance, technological proficiency in the baby boomer generation (1946-1964) may vary from that in the silent generation (1927-1946), but that gap may change in size or direction if other social categorizations are held constant.

Analysis of aging in fake news should also consider that age is just a number. While chronological age is commonly used to measure population aging, it does not sufficiently account for wide variations in economic, functional, and health characteristics (Skirbekk, Staudinger, & Cohen, 2018). This variability can limit the applicability of age-related fake news studies, even those controlling for factors such as gender and education. Researchers have backed alternative chronological age measures including grip strength, walking speed, and cognitive performance, which are comparable over time, region, and subpopulation (Skirbekk et al., 2018). Researchers could gain a better understanding of the age-fake news relationship by examining alternative aging measures when feasible. Furthermore, they could service readers by noting the limitations of chronological age measures.

To conclude, the mounting evidence suggesting older adults are disproportionately burdened by online fake news warrants added attention from researchers. Future studies, however, should be vigilant to avoid stereotyping and homogenization of this age group as such generalizations could promote ageist characterizations that lead to technological exclusion and other adverse outcomes. Additionally, findings based on arbitrary age thresholds could lead to myopic policy effective for only certain subpopulations. Aging should thus be evaluated as of many potentially interacting variables influencing fake news susceptibility and exposure. A nuanced approach to aging and fake news research can mitigate the widespread health and information externalities of fake news by providing more comprehensive evidence that informs policy and practice.

Regulation: Finding middle ground

Fake news is a pervasive online threat that exploits vulnerable individuals of all ages. Regulatory measures can help digital media consumers by reducing fake news dissemination and exposure. However, such measures are difficult to implement in the U.S. where political speech,

even when false, is protected by the First Amendment and social media companies disseminating false information are granted immunity through the Communications Decency Act (Timmer, 2017). With limited regulatory power and political will, the U.S. has relied on social media behemoths to self-regulate on issues such as privacy protection and information dissemination. This passive regulatory approach has yielded mixed results.

Facebook has enjoyed tepid success in its battle against online false information. The Guess et al. study (2019) that found higher rates of fake news sharing in older adults also noted that over 90% of users shared no fake news. Other research from Guess noted the rate of individuals reading fake news articles dropped from 27% to 7% since the 2016 election (Guess, Lyons, Montgomery, Nyhan, & Reifler, 2018). This noticeable decline could stem partly from Facebook's efforts to counteract false information through policy and algorithmic design (Allcott, 2018). Other self-regulatory efforts from have been less fruitful. A Facebook initiative designed to steer users away from false information by attaching warnings to fake news articles was ditched after studies showed it was ineffective (Murphy, 2017). While fake news has declined on Facebook since the 2016 election, it has increased on Twitter during that time period despite Twitter claiming to have banned millions of suspected fake accounts (Owen, 2018).

It would be remiss not to mention the potential for aggressive regulatory measures to infringe on liberty. For example, policy designed to shield individuals from false information could inhibit long-term ability to distinguish truth from fiction (Carey, 2017). Paternalistic policy targeting older adults could exacerbate ageist stereotypes by characterizing older adults as technophobic and cognitively impaired. While paternalistic action protecting vulnerable individuals can be justified on ethical grounds, older adults – representing a wide range of cognitive ability and ICT proficiency – are not sufficiently vulnerable to warrant such aggressive action. Still, there are middle-ground approaches such as those employed by governments outside the U.S.. The United Kingdom, for instance, launched a “Government Rapid Response Unit” tasked with countering fake news by expanding digital analysis of misinformation and disinformation, and dissemination accurate, clear, and responsive information to the public (Griggs, 2019). The unit was launched in response to accusations of Russia's meddling in prior elections by planting fake stories and photoshopped images (Reuters, 2018). Similarly, the European Union has attempted to crack down on social media giants such as Facebook and Twitter with the General Data Protection Regulation (GDPR), a law containing a provision

restricting how bad actors use personal data to target vulnerable individuals with online disinformation (Kornbluh, 2018). Rather than undermining autonomy and placing undue burden on digital media consumers, these interventions focus on the parties responsible for this public health threat: the online false information enablers.

Empowerment: Investing in literacy

The U.S. is facing unprecedented demographic transformation with older adults expected to outnumber children by 2035 (U.S. Census Bureau, 2018). Alas, this rapidly growing population has not been afforded the training and resources needed in the ever-changing digital world.

Fake news vulnerability in older adults is symptomatic of a societal issue recognized as the digital divide. Though regulatory measures mitigating exposure may help protect older adults from the perils of online false information, empowering interventions offer a more feasible and impactful alternative.). Alas, this rapidly growing population has not been afforded the training and resources needed in the ever-changing digital world. While ICT education is prioritized for children and young adults, numerous studies show it is overlooked for older Americans. Limited ICT access and resources can prevent older adults from reaping the health benefits associated with technology. Failure to provide older adults with sufficient access and resources would be neglecting vulnerable segments of the population. “If you can’t use technology, there’s going to be disparities on pretty much every level,” Czaja said.

Technological and digital literacy programs can help tackle the age-based digital divide. Organizations such as CREATE, SF Connected, and OATS have proven to be effective training resources and can help older adults navigate the perilous digital media landscape. Research on these programs has shown that benefits extend beyond technological and digital proficiency; older adults adopting to technology can experience increased independence, reduced loneliness, and other quality of life improvements. Though fake news is not a central focus of existing programs, its ill effects can be mitigated through improvements in digital literacy.

Seniors can also benefit from expansion of information and media literacy programs that cater to age group. Walton and other researchers have found that literacy interventions can train individuals to more effectively and accurately evaluate information. In a study of 16-17-year-old students at a UK school, Walton’s research team examined the effectiveness participatory

approach in which subjects participated in two workshops that included information and digital literacy. Subjects receiving the intervention adopted a cognitive questioning state which led to pro-active skepticism and ultimately, better information judgment (Walton, 2018).

Acknowledging the limited generalizability of his research – only certain age groups and individuals in academia are examined – Walton said the results show the potential for literacy as a remedy.

“We know from my previous research and others’ that we can actually raise people’s information discernment,” Walton said. “What we really need to do is see whether it sticks in the general population and what kind of interventions we need to help people gain information discernment which will add to their overall resilience.”

Paul Mihailidis, author of *Media Literacy and the Emerging Citizen: Youth, Engagement and Participation in Digital Culture*, has also achieved positive results in his work and research with younger populations. While the intervention in Walton et al. aimed to cultivate more critical consumers, Mihailidis & Viotty (2017) argue that media literacy should expand to be repositioned to respond to the post-fact culture by addressing the roots of the values of being a citizen. The article’s recommendations (connecting humans, focusing more on caring, participation in local issues, emphasizing civic impact) are primarily centered on young adults, but are translatable to other age groups, Mihailidis said. “I don’t think you need to invent new frameworks for older generations,” Mihailidis said.

Conclusion

Fake news is a public health problem impacting digital media consumers of all ages, but older adults may be especially susceptible to its harmful effects. Though there is limited literature on this topic, researchers speculate older adult fake news vulnerability is caused by age-driven inequalities in ICT proficiency and cognitive limitations associated with aging. This thesis argues that the disproportionate fake news burden absorbed by older adults can have far-reaching public health implications by harming vulnerable individuals and creating social costs.

Tackling the fake news problem in older adults requires a herculean effort. This begins with academic researchers, who should take a nuanced approach to evaluating age effects in future studies. Researchers should evaluate diverse populations and take into consideration generational cohort effects, intersectionality, and alternative chronological age measures. They

should also be mindful of how findings can promote ageist stereotypes when disseminated through media.

Regulatory policy can be an effective tool in protecting digital media consumers by reducing exposure to false information spread online. Though First Amendment protections pose barriers to regulation in the U.S., policies in United Kingdom and European Union that target fake news enablers offer a framework for a middle ground approach.

Lastly, empowerment through ICT literacy can help older adults navigate an increasingly perilous digital media environment while providing them with the tools to combat fake news. Organizations such as CREATE, SF Connected, and OATS offer digital and technology programs that have yielded promising results by including diverse populations and catering to the specific needs of older adults. ICT programs would benefit older adults further by focusing specifically on fake news. Walton, Mihailidis, and other researchers have demonstrated the effectiveness of information and media literacy programs for children and young adults; similar programs should be examined in older adult-focused organizations. Still, existing older adult technology and digital literacy programs provide fundamental skills and resources that can help seniors combat online threats in all forms. Additional funding on older adult-focused programs could create immense social and public health benefits. As demonstrated by the partnership between Apple and the News Literacy Project (Silverman, 2019), funding can come from a multitude of private and nonprofit sources outside of government.

Future research, regulatory policy, and older adult ICT literacy programs can each play a role in combatting fake news. With the U.S. facing unprecedented demographic transformation, it is vital that older adults are equipped to navigate the post-truth digital world.

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