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An Investigation of Misinformation Susceptibility of Older Adults: A Persuasive Perspective

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ABSTRACT

One group in our society that is particularly vulnerable to misinformation is older adults. While older adults have been recognized as being of high risk for misinformation, this demographic has been under-researched in the dark side of IT literature. This research-in-progress study seeks to understand how individual, medium, and message characteristics influence individuals' susceptibility toward misinformation and how these factors influence misinformation susceptibility differently across younger and older adults. A lab experiment is also proposed to verify the proposed relationships. This proposed research will provide much needed understanding on how older adults are impacted by the IT threat of misinformation and how to design support to encourage resilience to misinformation that results in improved well-being and mobility for older adults.

Keywords

Misinformation susceptibility, individual characteristics, medium characteristics, fear, older adults.

INTRODUCTION

Digital communication technologies have great potential to enrich and transform our personal, professional, and educational lives. As we are increasingly connected through technology and the Internet, we can experience great benefits through instant access to all kinds of information and connection to anyone, anytime from anywhere (Kim et al., 2011). However, these benefits or "bright sides" come with a dark side where IT can be misused, becomes a threat or causes harm. For example, misinformation, which refers to misleading and inaccurate information, has been increasingly circulated via social media (e.g., Facebook, Twitter) since the outbreak of COVID-19 (Ecker et al., 2022; Klimiuk et al., 2020;

Krishna & Thompson, 2021). For example, inaccurate COVID-19 treatments or vaccine side effects have circulated extensively in social media (Klimiuk et al., 2020; Krishna & Thompson, 2021), thus affecting individuals' ability to make informed health decision and ultimately negatively impacting their wellbeing.

One group in our society that is particularly vulnerable to misinformation is older adults. Over the past decade, older adults have increasingly embraced digital life to stay connected (Barnard et al., 2013; Wagner et al., 2010; Zhou et al., 2014). Further, during the pandemic, most social support programs moved online, which has further accelerated older adults' use of digital communication technologies. While online social networking websites can provide older adults with essential support and connectivity, these platforms also facilitate the spread of misinformation. In particular, a large amount of health-related misinformation is consumed by older adults, thus threatening their wellbeing and mobility. As a natural by-product of aging, older adults tend to have decreased cognitive functions (Garg et al., 2012), and thus may have difficulty detecting misinformation effectively. While older adults have been recognized as being of high risk for misinformation, this demographic has been under-researched in the dark side of IT literature. This research program aims to address this gap by investigating key antecedents to misinformation susceptibility for older adults from three perspectives: individual, medium, and message characteristics, according to the persuasion theoretical perspective. Given that there could be many factors within each of the individual, medium and message characteristics, this research addresses the factors which may affect misinformation vulnerability differently across older or younger adults. As such, this research aims to answer the following research questions:

RQ1: What are the most relevant individual, medium, and message characteristics influencing misinformation susceptibility?

RQ2: How are these factors influence misinformation susceptibility differently across younger and older adults?

The following sections will introduce the theoretical perspective and related literature, our research model and hypotheses, our proposed methodology, and conclusions.

THEORETICAL BACKGROUND AND RELATED LITERATURE

Persuasion theoretical perspective: Persuasion is “a successful intentional effort at influencing another's mental state through communication in a circumstance in which the persuadee has some measure of freedom” (O’Keefe 2016, p. 4). The focal perspective entails exploring how characteristics of the speaker/source, message, receiver/audience, and channel/medium determine persuasive outcomes. When considering misinformation as a persuasion process (Krishna & Thompson, 2021), we may interpret misinformation susceptibility as to what extent the misleading information is persuasive to a message receiver. For example, Chen et al. (2021) regard misinformation as a persuasion strategy and examines how the use of persuasive techniques in messages would increase misinformation diffusion. As such, from a communication persuasion perspective, it is important to understand characteristics of message receivers, medium of communication, and message content and their impacts of message persuasiveness. As such, in the following subsections, we introduce individual, medium, and message characteristics, and their influence on misinformation susceptibility. Given that there are many elements in these three dimensions, we focus on the elements that would be particularly salient for older adults.

Individual characteristic: Compared to younger adults, older adults tend to suffer more from cognitive decline, manifested in overall slowness in thinking and difficulties sustaining attention, keeping information in mind and processing information systematically (Taylor et al., 2018). This declined cognitive ability may lessen older adults’ effectiveness at detecting misinformation. In addition, as compared to younger adults, older adults are more likely to suffer from chronic illness (e.g., high blood pressure, heart disease, diabetes), chronic or severe pain, damage to body image due to surgery or sickness (Ong et al., 2016), which can contribute to anxiety and mental stress that result in psychological vulnerability toward misinformation threats. As such, we seek to examine how individual characteristics of overall health affects susceptibility to misinformation differently across older and younger adults.

Medium characteristics: The medium of the message may also be important in determining older adults’ response toward misinformation. One salient medium characteristic is the digitalization of media. Compared to younger adults who are born in the digital age, older adults tend to prefer

traditional media to digital media for information seeking (Choudrie et al., 2021). For older adults who have limited digital literacy, being exposed to digitalized misinformation can make them more susceptible than younger adults (Choudrie et al., 2021; Seo et al., 2021). As such, misinformation in traditional versus digital medium may have differentiated impacts on susceptibility to misinformation across younger and older adults.

Message characteristics: Message characteristic have been shown to have significant impact on older adults’ motivation and trust toward the message (Das et al., 2008; Liu et al., 2019), which may ultimately influence their susceptibility to misinformation. This research will seek to investigate message emotional appeal and its impact on susceptibility to misinformation across younger and older adults. An often-used persuasion tactics in misinformation is fear appeal that attempts to arouse fear in order to divert behavioral compliance. Misinformation applying fear appeal often presents misleading information about a risk, the vulnerability to the risk (Weeks et al. 2015). The state of fear is unpleasant and thus individuals often apply cognitive, affective, and behavioral responses to alleviate the threat or fear. In the focal research, we seek to investigate how fear appeal of misinformation impacts susceptibility differently across younger and older adults.

Differences across older and younger adults: Generally speaking, older adults are perceived as having difficulties with cognition and memory compared with younger adults. Although not always the case, it is well known that memory performance in older adults can decrease with age (Barnes et al., 2004). When people receive misleading information, it can lead to memory distortion for the original event or fact, which is more likely to occur in older adults who experience memory deficit (Seo et al., 2021). In addition, older adults are more likely to experience chronic diseases, such as high blood pressure or heart related disease. These health problems may bring more worry and anxiety to older adults, as compared to younger adults. Furthermore, younger adults were born with technology, while older adults may need to learn these emerging technologies in their later life. Various studies have reported that older adults tend to have more technological difficulty in engaging with technologies (Wagner et al., 2010, 2014).

RESEARCH MODEL

The overall research framework is presented in Figure 1. This research will investigate how individual characteristic, medium characteristic, and message characteristic influence susceptibility to misinformation differently across younger and older adults.

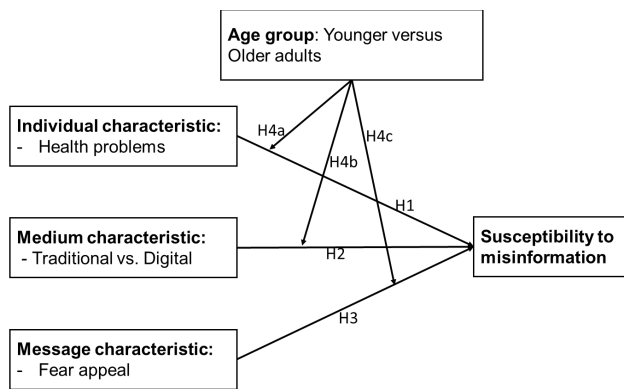


Figure 1. Research Model

Experience of health problems often lead to psychological anxiety and vulnerabilities (Horwitz, 2010). Meanwhile, misinformation may take advantage of individuals' psychological vulnerabilities by disseminating health-related misinformation. For instance, during the COVID-19 pandemic, misinformation is surging, taking advantage of individuals' anxiety and uncertainty about the disease (Choudrie et al., 2021). As such, we expect that individuals experiencing health problems are more likely to be susceptible to misinformation.

H1. Experience of health problems is positively related to susceptibility to misinformation.

Although misinformation can be disseminated through different types of medium, such as digital or traditional, we expect that misinformation through digital media leads to more susceptibility. Misinformation through digital medium can take advantage of the technology and customize the content based on individuals' digital traces (Yang et al., 2022). In addition, ubiquitous IT applications tend to push digital messages at an unprecedented rate, and thus individuals tend to get ubiquitous exposure to misinformation through digital media. Thus, we propose the following hypothesis.

H2. Misinformation through digital media is more positively associated with susceptibility toward misinformation, as compared to misinformation through traditional media.

Emotional appeal can significantly enhance individuals' memory for message content (Lee & Koo, 2012). Individuals generally get more attended toward information with emotional appeals. For example, emotions used in misinformation can significantly increase individuals' likelihood to trust them and further diffuse them (Weeks et al. 2015). One salient emotional appeal used in misinformation is fear. Through fear appeal, misinformation attracts message receivers' attention and persuade them to believe in the misinformation and further diffuse it (Sangalang et al., 2019). As such, we propose the following hypothesis:

H3. Misinformation with fear appeal is more positively associated with susceptibility toward misinformation.

Older adults are more likely to experience health problems, than younger adults. Meanwhile, misinformation often takes advantage of older adults' psychological vulnerability toward health problems, and often involves misleading health related information (Krishna & Thompson, 2021). Thus, we propose the following disparity between younger and older adults.

H4a: The relationship between health problems and susceptibility to misinformation will be strengthened among older adults, as compared to younger adults.

In addition, older adults have lower digital literacy than do younger adults. Older adults may be less savvy at identifying reliable online news sources, advertised (vs editorial) content, and manipulated photographs in digital medium (Grimes et al., 2010). As such, when encountering misinformation through digital medium, older adults are more vulnerable than younger adults.

H4b: The relationship between digital medium and susceptibility to misinformation will be strengthened among older adults, as compared to younger adults.

Older adults have been highlighted as a vulnerable group to psychological impacts and one psychological health concern that has been recognized is anxiety (Eysenck et al., 2007; Horwitz, 2010). When evaluating fear appeal in misinformation, older adults may be anxious or worried about the threat proposed in the misinformation and thus adopt maladaptive coping behaviors (Zeidner & Saklofske, 1996). However, younger adults have stronger processing capability and engage in cognitive coping (Folkman et al., 1986), and thus may analyze the credibility and impact of the presented fear in misinformation. As such, we expect that older adults are more vulnerable toward fear appeal compared to their younger counterparts.

H4c: The relationship between fear appeal in misinformation and susceptibility to misinformation will be strengthened among older adults, as compared to younger adults.

METHODOLOGY

A lab experiment will be designed to investigate antecedents to older adults' susceptibility to misinformation. The experiment will follow a 2x2x2 fractional factorial experimental design, where the first factor manipulates two levels of medium characteristic (i.e., traditional vs. digital media), the second factor manipulates two levels of message fear appeal (i.e., presence vs. non-presence), and the third factor manipulates the age group (i.e., younger vs. older adults). The individual characteristics regarding cognitive decline and overall health will be measured through survey measures, rather than experimental manipulation. For this controlled experiment, 80 older adults (20 replications per cell) and 80 younger adults will be asked to interact with misinformation to reach a medium effect size and a power of 0.80. For this investigation, the focus will be on health-related misinformation. Cognitive decline will be assessed

through a digital span working memory task (Conway et al., 2005), where participants will be asked to remember a sequence of 8-digit numbers. Health condition/wellbeing will be assessed through perceptual measures, as with susceptibility to misinformation (Ampofo et al., 2011; Edmondson, 2004; Samson & Kostyszyn, 2015).

Experimental sessions will be conducted at the McMaster Digital Transformation Research Centre (MDTRC) where neurophysiological equipment will allow for additional unobtrusive measurement of behavioural (e.g., eye movements, facial emotion reading), physiological (e.g. EKG, EMG, GSR), and cognitive (e.g., EEG) activities of users engaged in real-time response to misinformation. It is anticipated that these neurophysiological techniques will provide rich data insights into participants' attention, focus and stress which will be triangulated with perceptual survey results. The MDTRC includes a Mobile User Experience Lab (MUXL) which can be driven to participants to enable neurophysiological data collection at the residences of older adults. The MULX will ensure an inclusive sampling strategy allowing access to older adults with vary degrees of mobility.

ANOVA analysis will be performed to understand the impacts of medium digitalization and message appeal on susceptibility to misinformation across younger and older adults. Regression analysis will be performed to evaluate the impacts of individual characteristics of cognitive decline and health problems. By transforming individual characteristics into dichotomous variables (i.e., low versus high cognitive decline, good versus poor health/wellbeing), further ANOVA analysis can be performed to understand any interactive impacts among message characteristics, individual characteristics, and medium characteristics.

CONCLUSION

Older adults have increasingly embraced digital life, especially during the pandemic where many social, health and commerce offerings have had to move online. This increased exposure to the Internet and digital services, which are expected to continue post-pandemic, has created significant threats to older adults who are particularly vulnerable to IT threats. This proposed research will provide much needed understanding on how older adults are impacted by the IT threat of misinformation and how to design support to encourage resilience to misinformation that results in improved well-being and mobility for older adults. It will inform designers of technologies/platforms and those directing policy in combating IT threats. The proposed program of research also provides a comprehensive perspective to understanding misinformation susceptibility from individual, medium, and message characteristics. As such, our deepened understanding toward older adults' misinformation susceptibility will facilitate design for protecting older adults from misinformation vulnerability, which subsequently improves their mobility and overall well-being.

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