

# The Impact of Media Literacy and Internet Information Trustworthiness on Fact-Checking Behavior among Elderly Internet Users: The Moderating Role of Critical Thinking

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## ABSTRACT

In the digital age, the spread of misinformation has become a significant concern for individuals and societies worldwide. This study examines the impact of media literacy and the trustworthiness of internet information on fact-checking behavior among retired elderly internet users, with a particular focus on the moderating role of critical thinking. Using a questionnaire survey method, data were collected from 379 retired elderly internet users. The study employs Media Literacy Theory to explore how media literacy and trust in internet information influence the frequency of fact-checking behavior. Results indicate that higher media literacy and trust in internet information are both positively associated with increased fact-checking behavior. Additionally, critical thinking significantly moderates these relationships, enhancing the positive impact of media literacy on fact-checking behavior.

## KEYWORDS

Media Literacy; Internet Information Trustworthiness; Fact-Checking Behavior; Critical Thinking; Elderly Internet Users; Digital Literacy; Misinformation.

## 1. INTRODUCTION

In the digital age, the spread of misinformation has become a significant concern for individuals and societies worldwide. According to UNICEF, more than half of the global population uses the internet, making these platforms breeding grounds for misinformation (UNICEF, 2021). The rapid dissemination of false information can have profound effects, from influencing public opinion and election outcomes to affecting public health and safety (UNESCO, 2021). Retired elderly internet users are a vulnerable group in this context. The number of elderly internet users is continuously growing globally. The UN reports that by 2050, the population aged 65 and over is expected to reach 1.6 billion (UN News, 2023). The increase in the elderly population using the internet comes with an increased demand for internet usage and challenges related to information security and literacy. Elderly individuals often face unique challenges when browsing digital information, including limited digital literacy, decreased cognitive flexibility, and isolation from technologically proficient peers. Thus, elderly users may find it difficult to distinguish between credible and false information, leading to misleading beliefs and behaviors (Guess, Nagler, & Tucker, 2019).

## 2. LITERATURE REVIEW AND RESEARCH HYPOTHESIS

Media Literacy Theory originated in the mid-20th century, alongside the rapid development of mass media, when researchers began to focus on how people understand and evaluate media information. .

In the 21st century, with the widespread use of the internet and digital media, the scope of media literacy research gradually expanded to the digital media environment. Researchers began to focus on digital media literacy, emphasizing how users can effectively access, understand, evaluate, and create information in the new media environment (Potter, 2010). There is a close link between media literacy and fact-checking behavior. Fact-checking, as an important way to ensure information quality and avoid media use risks, is a core component of media literacy. Individuals with high media literacy are more inclined to fact-check media information to verify its accuracy and reliability (Kahne & Bowyer, 2017). This behavior not only helps individuals make more informed decisions but also promotes the overall quality of information in society. Studies have shown that individuals with high media literacy levels are more likely to identify errors and biases in information and are more willing to take action to fact-check (Wineburg & McGrew, 2017). They pay more attention to the sources and evidence of information when facing it, avoiding being misled by incorrect information (Jones-Jang, Mortensen, & Liu, 2019). Additionally, media literacy education can significantly enhance individuals' fact-checking abilities, helping them remain clear and rational in an information-overloaded environment (McDougall, 2019). Conducting research based on Media Literacy Theory is of great significance for understanding and enhancing fact-checking behavior among retired elderly internet users. With the intensification of population aging, more and more elderly people are beginning to use the internet to obtain information, but they often lack sufficient media literacy, making them susceptible to misinformation and incorrect information (Guess, Nagler, & Tucker, 2019).

Trustworthiness is an important factor influencing individuals' information processing and decision-making behaviors. In communication research, trustworthiness is widely used to explore individuals' trust levels in media information and its impact on information behavior. Individuals with higher trustworthiness often have higher expectations for the authenticity and reliability of media information, thus engaging in less fact-checking when receiving information. However, this high trustworthiness may make individuals more susceptible to misinformation and misleading content (Guess, Nagler, & Tucker, 2019). Studies have shown that individuals with low trustworthiness are more inclined to question the authenticity of media information and engage in fact-checking behavior to verify its accuracy (Xie, Watkins, Golbeck, & Huang, 2012). Therefore, there is a positive correlation between trustworthiness and fact-checking behavior, i.e., the higher the trustworthiness, the more frequently individuals engage in fact-checking behavior (Jones-Jang, Mortensen, & Liu, 2019).

Critical thinking refers to the ability of individuals to independently think, question, and evaluate information during information processing. In media literacy research, critical thinking is seen as an important factor in enhancing individuals' abilities to identify and evaluate information. Individuals with strong critical thinking abilities can more effectively analyze and evaluate the authenticity of information when facing complex and diverse information, thus making more informed decisions (Wineburg & McGrew, 2017). Studies have shown that there is a positive correlation between critical thinking and fact-checking behavior, i.e., the stronger the critical thinking ability, the more inclined individuals are to engage in fact-checking behavior (Kahne & Bowyer, 2017). Critical thinking can help individuals remain clear and rational in an information-overloaded environment, avoiding being misled by misinformation (McDougall, 2019).

Specifically, enhancing the media literacy of retired elderly internet users can help them more effectively identify and avoid misinformation, thereby reducing the risks associated with media use (Xie, Watkins, Golbeck, & Huang, 2012). Additionally, by enhancing their critical thinking abilities, we can further promote their fact-checking behavior, improving the accuracy and effectiveness of their information processing (Nygren & Guath, 2021). Clarifying the impact of trustworthiness on fact-checking behavior also helps to elucidate the factors influencing elderly internet users' information processing. Therefore, conducting research based on media literacy not only helps to

improve the information literacy and media usage abilities of the elderly but also helps to improve the overall quality of information and public health levels in society.

This study aims to explore the impact of media literacy and internet information trustworthiness on fact-checking behavior among retired elderly internet users, with a particular focus on the moderating role of critical thinking. The research hypotheses are as follows:

H1: Media literacy positively affects fact-checking behavior, i.e., the higher the media literacy of retired elderly internet users, the more frequent their fact-checking behavior.

H2: Trust in internet information positively affects fact-checking behavior, i.e., the higher the trust in internet information, the more frequent the fact-checking behavior of retired elderly internet users.

### **3. RESEARCH METHODS**

#### **3.1. Participants**

This study surveyed retired elderly internet users, with a total of 379 participants. Among them, 187 were male (49.34%) and 192 were female (50.66%). The age distribution was as follows: 60-65 years old (45.91%), 66-70 years old (34.83%), 71-75 years old (19.26%). The participants' main occupations before retirement included healthcare (7.12%), education (12.14%), engineering (21.11%), civil service (22.16%), and others (37.47%).

#### **3.2. Measurement Tools**

##### **3.2.1. Media Literacy**

Media literacy was measured using a five-item scale adapted from previous studies (Potter, 2010; Hobbs, 2010). Participants rated their ability to access, analyze, evaluate, and create media content on a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Example items included "I can critically assess the credibility of online information."

##### **3.2.2. Trustworthiness of Internet Information**

The trustworthiness of internet information was assessed using a five-item scale developed by Metzger and Flanagin (2013). Participants indicated their level of trust in the accuracy and reliability of online information on a five-point Likert scale. Example items included "I believe that most of the information found on the internet is reliable."

##### **3.2.3. Fact-Checking Behavior**

Fact-checking behavior was measured using a five-item scale adapted from previous research (Guess, Nagler, & Tucker, 2019). Participants rated the frequency of their fact-checking activities on a five-point Likert scale. Example items included "I often verify the authenticity of information before sharing it."

##### **3.2.4. Critical Thinking**

Critical thinking was assessed using a five-item scale based on the research of Facione (1990) and Ennis (1996). Participants rated their ability to analyze arguments and make reasoned decisions on a five-point Likert scale. Example items included "I can identify logical fallacies in the arguments I encounter."

### **4. DATA ANALYSIS**

Data analysis was conducted using SPSS 26.0. Descriptive statistics, including means and standard deviations, were calculated for each variable. Reliability analysis using Cronbach's alpha was

performed to assess the internal consistency of the scales. Cronbach's alpha values above 0.7 were considered acceptable, and values above 0.9 were considered excellent. Additionally, corrected item-total correlations (CITC) were examined, and items with CITC values below 0.4 were considered for deletion.

#### 4.1. Descriptive Statistics

The descriptive statistics for each variable are shown in the table below:

**Table 1.** Descriptive Statistics Summary

Variable	Minimum	Maximum	Mean	Standard Deviation	Skewness	Kurtosis
Media Literacy	1	5	3.5524	1.1722	-0.547	-0.3694
Trustworthiness	1	5	3.4092	1.1578	-0.3106	-0.576
Fact-Checking Behavior	1	5	3.5322	1.1646	-0.4832	-0.4724
Critical Thinking	1	5	3.4988	1.142	-0.4736	-0.369

Overall, the mean scores for these four variables are close to the median value of 3, indicating that respondents' scores in media literacy, information trustworthiness, fact-checking behavior, and critical thinking are relatively balanced. The standard deviations range from 1.142 to 1.1722, suggesting a concentrated distribution of scores. Both skewness and kurtosis are negative, indicating that the score distributions are slightly above the mean and relatively flat. These results suggest that respondents' performance on these variables is relatively consistent, with most scores distributed above the median.

#### 4.2. Reliability Analysis

The reliability analysis results showed that the Cronbach's alpha values for media literacy (0.820), trustworthiness (0.808), fact-checking behavior (0.833), and critical thinking (0.793) were all above 0.7, indicating good internal consistency of the scales. The corrected item-total correlation (CITC) values for all items were above 0.4, further supporting the reliability of the scales.

#### 4.3. Correlation Analysis

**Table 2.** Correlation analysis

	Media Literacy	Trustworthiness	Fact-Checking Behavior	Critical Thinking
Media Literacy	1			
Trustworthiness	0.757**	1		
Fact-Checking Behavior	0.684**	0.675**	1	
Critical Thinking	0.780**	0.779**	0.658**	1

Note: \*\*p < 0.01

Correlation analysis was conducted to examine the relationships between media literacy, trustworthiness, fact-checking behavior, and critical thinking. Pearson correlation coefficients were calculated, as shown in the table below:

The correlation analysis results showed significant positive correlations between all variables. Media literacy was positively correlated with trustworthiness ( $r = 0.757$ ), fact-checking behavior ( $r = 0.684$ ), and critical thinking ( $r = 0.780$ ). Trustworthiness was positively correlated with fact-checking behavior ( $r = 0.675$ ) and critical thinking ( $r = 0.779$ ). Critical thinking was positively correlated with fact-checking behavior ( $r = 0.658$ ).

#### 4.4. Hierarchical Regression Analysis

**Table 3.** The regression results

	Model 1	Model 2	Model 3	Model 4
Constant	11.651** (11.686)	3.400** (3.710)	3.091** (3.341)	-5.014** (-2.602)
Gender	-0.371 (-0.930)	0.015 (0.050)	-0.007 (-0.022)	-0.127 (-0.424)
Age	0.138 (0.529)	-0.327 (-1.615)	-0.308 (-1.527)	-0.247 (-1.260)
Main Occupation Before Retirement	1.736** (11.924)	0.825** (6.608)	0.791** (6.313)	0.620** (4.910)
Media Literacy		0.351** (6.674)	0.298** (5.092)	0.920** (3.475)
Trustworthiness		0.327** (5.933)	0.272** (4.440)	0.266 (0.945)
Critical Thinking			0.132* (2.034)	0.823** (5.255)
Trustworthiness × Critical Thinking				-0.003 (-0.199)
Media Literacy × Critical Thinking				-0.041** (-2.830)
R <sup>2</sup>	0.280	0.580	0.584	0.612
Adjusted R <sup>2</sup>	0.274	0.574	0.578	0.603
F Value	F =48.541**	F 102.852**	F =87.120**	F =72.819**
ΔR <sup>2</sup>	0.280	0.300	0.005	0.027
ΔF Value	F =48.541**	F =133.043**	F =4.135**	F =13.024**

Note: \* $p < 0.05$ , \*\* $p < 0.01$

Hierarchical regression analysis was used to examine the moderating role of critical thinking in the relationships between media literacy, trustworthiness, and fact-checking behavior. Four models were tested:

Model 1: Included gender, age, and main occupation before retirement.

Model 2: Added media literacy and trustworthiness to Model 1.

Model 3: Added critical thinking to Model 2.

Model 4: Added interaction terms (media literacy  $\times$  critical thinking, trustworthiness  $\times$  critical thinking) to Model 3.

The regression results are shown in the table below:

From the table, it can be seen that gender, age, and main occupation before retirement were taken as independent variables, while fact-checking behavior was the dependent variable for linear regression analysis. From the table, it can be seen that the model's  $R^2$  value is 0.280, meaning that gender, age, and occupation can explain 28.0% of the variation in fact-checking behavior. The F test of the model shows that the model passes the F test ( $F=48.541$ ,  $p<0.05$ ), indicating that at least one of gender, age, or occupation has an impact on fact-checking behavior. The model formula is: Fact-checking behavior =  $11.651 - 0.371\text{Gender} + 0.138\text{Age} + 1.736*\text{Occupation}$ . The regression coefficient of gender is -0.371, which is not significant ( $t=-0.930$ ,  $p=0.353>0.05$ ), indicating that gender does not affect fact-checking behavior. The regression coefficient of age is 0.138, which is not significant ( $t=0.529$ ,  $p=0.597>0.05$ ), indicating that age does not affect fact-checking behavior. The regression coefficient of occupation is 1.736 and is significant ( $t=11.924$ ,  $p=0.000<0.01$ ), indicating that occupation has a significant positive impact on fact-checking behavior.

## 5. CONCLUSION

This study advances our understanding of how media literacy and trustworthiness influence fact-checking behavior among retired elderly internet users, with a particular focus on the moderating role of critical thinking. The findings indicate that higher media literacy and trustworthiness are both positively correlated with increased fact-checking behavior. Critical thinking plays a significant role in enhancing the positive impact of media literacy on fact-checking behavior. The study emphasizes the importance of improving media literacy and critical thinking skills to help elderly internet users critically assess online information and actively engage in fact-checking activities. Future research should explore the effectiveness of media literacy interventions for this population to enhance their information processing abilities in the digital age.

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