

Reflective and Formative Indicators of Information Credibility on Social Media

AUTHORS SECTION

Choi, Wonchan

School of Information Studies, University of Wisconsin-Milwaukee, USA | wchoi@uwm.edu

Zhu, Liya

School of Information Studies, University of Wisconsin-Milwaukee, USA | liyazhu@uwm.edu

Lee, Hyun Seung

School of Information Studies, University of Wisconsin-Milwaukee, USA | lee649@uwm.edu

ABSTRACT

As part of a larger project to develop a scale for measuring web credibility perceptions, this poster reports on preliminary findings of a literature analysis to identify reflective and formative indicators of information credibility on social media. Of 90 papers found by a systematic database search and screening, this poster examines 20 papers focused on information credibility on microblogs (e.g., Twitter, Weibo) as a popular source for online users' information seeking. Our analysis identified 22 reflective indicators (e.g., fair, accurate) and 31 formative indicators (e.g., reputable, attractive), eight (e.g., trustworthy, unbiased) of which overlapped. Given the intertwined, often blurred border between these two sets of items, the coding scheme developed in the present study can help determine the relevance and type of the items. Future research directions are discussed.

KEYWORDS

Information credibility; web credibility; social media; scale; information behavior

INTRODUCTION

Assessing the credibility of web-based information resources, also called web credibility assessment, is playing an increasingly important role in end-user information behaviors, such as selecting an online source over alternatives, evaluating the quality of information, avoiding or accepting advice on the web, and sharing online information with others (Choi et al., 2022). Our recent findings analyzing the literature on web credibility found several limitations in existing scales measuring users' perceptions of information credibility on various web platforms (Choi & Zhu, 2023). First, many published studies (e.g., Samuel-Azran & Hayat, 2019) have relied on credibility scales developed in the interpersonal or mass communication context (e.g., Gaziano & McGrath, 1986), which are limited to the characteristics of human sources (e.g., speakers) or traditional mass media (e.g., newspaper, radio, television). Second, despite scholars generally agreeing that credibility is a multidimensional construct (Choi & Stvilia, 2015), most published papers to date have conceptualized credibility as a one-dimensional construct and used only one item to measure it (e.g., credible; Casero-Ripolles, 2020). Third, many studies used reflective indicators of credibility (i.e., items that reflect the perception of credibility) and formative indicators (i.e., items that contribute to the perception of credibility) without clearly distinguishing them. The combined evidence supports the need for a validated scale for measuring users' perceptions of information credibility on the web. As part of a larger project to address this need, this poster explores the following research question: What reflective and formative indicators of information credibility on social media have been examined in the literature?

METHODS

Data Collection

To identify empirical studies on users' perceptions of information credibility in the social media context, we systematically searched Web of Science in the categories of information science, library science, and associated fields, including computer science information systems, computer science interdisciplinary applications, and communication. We used the following search query: (credibility OR information credibility OR web credibility) AND (social media OR social platform OR interactive platform OR web platform OR Facebook OR Twitter OR artificial intelligence OR AI). Our last search, conducted in August 2023, yielded 1,153 papers. We screened the retrieved papers to determine their relevance for further analysis. First, we selected papers whose author keywords contained "credibility" or related phrases (e.g., "information credibility," "source credibility," "message credibility"). Second, we reviewed the titles and abstracts to determine each paper's relevance. Third, we reviewed the full text of the remaining papers. As a result, 90 papers were included. Here, we report preliminary findings of an analysis of 20 papers that measured information credibility on microblogs, such as Twitter and Weibo.

Coding Scheme Development and Data Analysis Procedure

We conducted qualitative coding of 98 items used in the 20 included papers to categorize them into two groups—reflective and formative indicators. We developed a coding scheme through four iterations, each involving independent test-coding of a subset of the data and multiple group discussions to resolve discrepancies in coding

results and refine coding rules. Two authors used the final coding scheme (Table 1) to analyze the entire dataset. Specifically, each coder independently determined whether each item was a reflective or formative indicator. Reflective indicators were further coded as either trustworthiness or expertise (two key underlying dimensions of credibility; Hovland et al., 1953). Formative indicators were further coded into one of three categories based on the web credibility framework (Fogg, 2003): author, content, or design. Items worded as the target concept (i.e., credible) or other high-level terms regarded as synonyms of credibility in the literature (e.g., believable; Fogg, 2003) were classified as “not codable.” When a study used only one item, it was coded as “single item.” Last, items deemed not closely related to credibility were coded as “unrelated.” The intercoder reliability test using Krippendorff’s alpha (.82) indicated a high level of agreement between coders (Krippendorff, 2004). Disagreements in the coding results were resolved through a group discussion.

Category	Code	Example
Reflective indicators: Items reflecting the perception of credibility	Trustworthiness: The extent to which the information is perceived as being free from bias and absent from deceptive intentions	<ul style="list-style-type: none"> • Unbiased • Fair
	Expertise: The degree of the depth of understanding and the ability to provide accurate, insightful, and competent information	<ul style="list-style-type: none"> • Accurate • Complete
Formative indicators: Items contributing to the perception of credibility	Author: Characteristics of the author of the content	<ul style="list-style-type: none"> • Honest
	Content: Semantic and structural attributes of the content	<ul style="list-style-type: none"> • Concise
	Design: Visual and functional elements of the site	<ul style="list-style-type: none"> • Easy to use

Table 1. Coding Scheme

FINDINGS

Of the 98 items identified from 20 included papers, 15 items were not codable (e.g., credible) or unrelated (e.g., will have impact). Of the 78 relevant items, we combined items using the same or similar wordings (e.g., accuracy and accurate), which resulted in 45 uniquely worded items. Twenty-two (48.9%) were reflective indicators, 12 of which reflected trustworthiness (e.g., trustworthy, fair) and 10 of which reflected expertise (e.g., accurate, complete). Thirty-one items (68.9%) were categorized as formative indicators, 27 of which involved the author’s characteristics (e.g., reputable, attractive), and four related to the content attributes (e.g., well-presented, concise). Eight items (17.8%) were used as both reflective and formative indicators across studies (e.g., biased, complete). Figure 1 presents 15 items employed by more than one paper we analyzed.

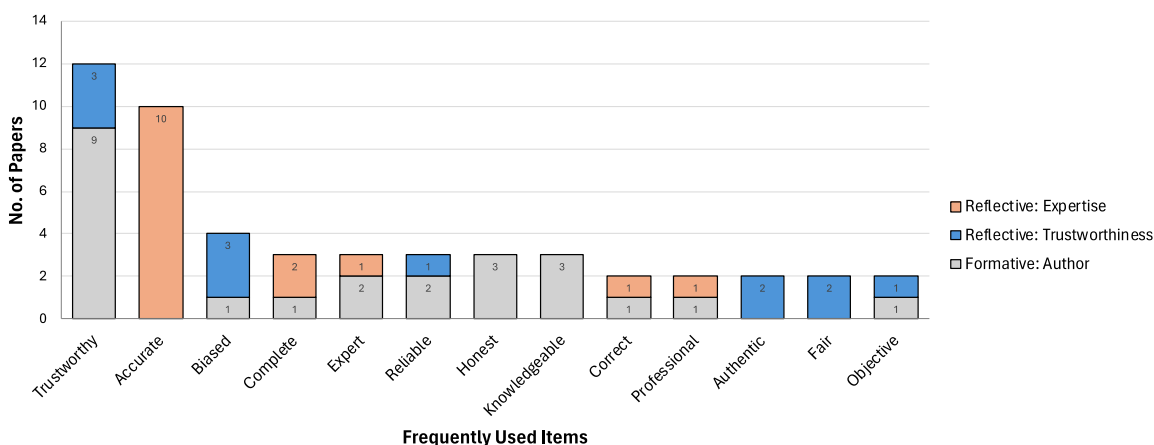


Figure 1. Frequently Used Items to Measure Information Credibility on Social Media

DISCUSSION AND CONCLUSION

Our findings show that “accurate” was the most commonly used item to measure the perceived expertise of information on microblogs, whereas “trustworthy” and “biased” were most frequently used to measure perceived trustworthiness in the analyzed literature. The eight items used as both reflective and formative indicators in the previous research highlight the versatile and abstract nature of credibility as a construct to be measured in empirical studies (Rieh & Danielson, 2007). The mixed use of reflective and formative indicators without a clear conceptual distinction can cause difficulty in interpreting the causes and results of web credibility assessments. Our findings warrant the development of a new scale for measuring users’ perceptions of information on the web, alongside a list

of index items that capture the unique characteristics of current and newly emerging information retrieval systems that may influence web credibility perceptions.

GENERATIVE AI USE

We confirm that we did not use generative AI tools or services to author this submission.

AUTHOR ATTRIBUTION

Wonchan Choi: conceptualization, methodology, data curation, formal analysis, supervision, visualization, writing – original draft, writing – review & editing; Liya Zhu: conceptualization, methodology, data curation, formal analysis, writing – review & editing; Hyun Seung Lee: conceptualization, methodology, formal analysis, writing – review & editing.

REFERENCES

- Casero-Ripolles, A. (2020). Impact of Covid-19 on the media system. Communicative and democratic consequences of news consumption during the outbreak. *El Profesional de La Información*, 29(2), e290223. <https://doi.org/10.3145/epi.2020.mar.23>
- Choi, W., Kim, S.-Y., & Luo, M. (2022). Design matters in web credibility assessment: Interactive design as a social validation tool for online health information seekers. *Asian Communication Research*, 19(3), 119–138. <https://doi.org/10.20879/acr.2022.19.3.119>
- Choi, W., & Stvilia, B. (2015). Web credibility assessment: Conceptualization, operationalization, variability, and models. *Journal of the Association for Information Science and Technology*, 66(12), 2399–2414. <https://doi.org/10.1002/asi.23543>
- Choi, W., & Zhu, L. (2023). Preliminary findings on developing a scale for credibility assessment on interactive web platforms. *Proceedings of the Association for Information Science and Technology*, 60(1), 929–931. <https://doi.org/10.1002/pra2.901>
- Fogg, B. J. (2003). *Persuasive technology: Using computers to change what we think and do*. Morgan Kaufmann.
- Gaziano, C., & McGrath, K. (1986). Measuring the concept of credibility. *Journalism Quarterly*, 63(3), 451–462. <https://doi.org/10.1177/107769908606300301>
- Hovland, C. I., Janis, I. L., & Kelley, H. H. (1953). *Communication and persuasion*. Yale University Press.
- Krippendorff, K. (2004). Reliability in content analysis: Some common misconceptions and recommendations. *Human Communication Research*, 30(3), 411–433. <https://doi.org/10.1111/j.1468-2958.2004.tb00738.x>
- Rieh, S. Y., & Danielson, D. R. (2007). Credibility: A multidisciplinary framework. *Annual Review of Information Science and Technology*, 41(1), 307–364. <https://doi.org/10.1002/aris.2007.1440410114>
- Samuel-Azran, T., & Hayat, T. (2019). Online news recommendations credibility: The tie is mightier than the source. *Comunicar*, 27(60), 71–80. <https://doi.org/10.3916/C60-2019-07>