Perceived credibility of Internet encyclopedias

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ABSTRACT

A vast amount of information is now available online, produced by a variety of sources with a range of editorial oversight procedures. These range from very centralized information with multiple layers of review, to no oversight at all. Determining which information is credible can pose a real challenge. An experiment was designed to determine whether certain webpage characteristics affect academics' and students' perception of the credibility of information presented in an online article. The experiment looked at five peripheral cues: (1) presence or absence of an identifiable author, (2) presence or absence of references, (3) presence or absence of a biased sponsor, (4) presence or absence of an award, and (5) whether the article is designated as appearing in Encyclopedia Britannica, Wikipedia, or Encyclopedia of Earth. The results indicate that compared to Encyclopedia Britannica, article information appearing in both Encyclopedia of Earth and Wikipedia is perceived as significantly less credible. They also show that the presence of a biased sponsor has a significant negative effect on perceived credibility.

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1. Introduction

As academia embraces online information sources, conventional sources are becoming less utilized. Printed books, volumes of encyclopedias, and hardcopy journals have become secondary sources of information to most college students and professors. Approximately 73% of college students indicate that they utilize the Internet more than libraries (Jones, 2002). This shift in information sources has created access to significantly more information, some with the same high quality as conventional sources, but others with significant deficits in quality. Determining the credibility of this information has fallen upon students and professors who utilize the information. Many universities have begun providing Internet literacy as part of freshman courses in the hopes of providing students the skills to evaluate information obtained online (Metzger et al., 2003c).

One primary cause of the discrepancy between the quality of different online sources is that much of the information placed on the Web has little editorial oversight (Flanagin & Metzger, 2000; Johnson & Kaye, 2004). Anyone can place anonymous information on the Web, eliminating social and professional peer pressure to ensure quality (Johnson & Kaye, 1998) and increasing the amount of fraud and misinformation available (Mintz, 2002). In theory, editorial review enhances the quality and accuracy of information; as it can place a name or brand, a reputation, behind the information.

However, the decentralization of information sharing also has advantages. New information is spread almost instantaneously and can be viewed by millions within a few hours. It can reach the most remote locations, allowing anyone to assess information and contribute their knowledge to the conversation (Brafman & Beckstrom, 2006). Because everyone can contribute, this potentially increases the quantity of available information significantly.
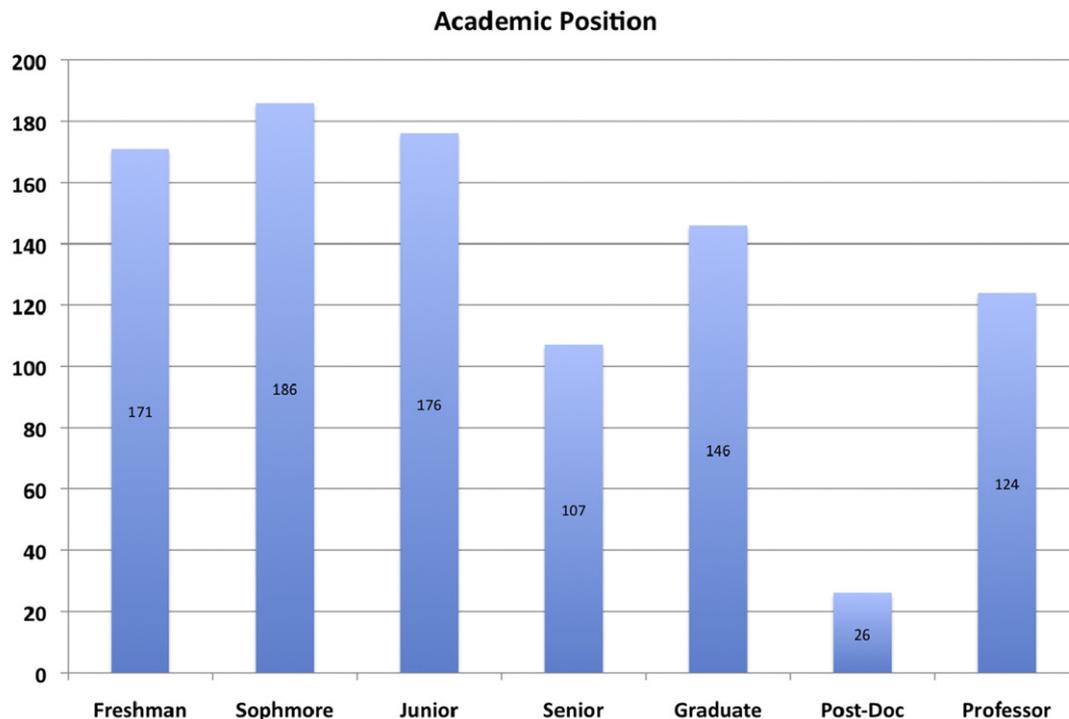
Academic Position

Fig. 1. The academic distribution of subjects who took the survey.

The Internet has also allowed for new forms of dialog and information sharing. Blogs, forums, wikis, chats, social networks, and other new software being developed allow for multiple options, creating a greater range of editorial oversight. Centralized information systems exist on the World Wide Web, however they usually parallel traditional information sources (Metzger et al., 2003a, 2003b). Encyclopedia Britannica is one such example. Started in the 18th century, its volumes have been a staple of knowledge within educated homes for centuries. A version was copied into digital format in the early 1980s and online accessibility has grown ever since, while keeping its editorial oversight and quality assurance. To retain that quality and credibility, Encyclopedia Britannica utilizes significant resources for hiring staff to solicit and edit articles, and to manage the content. Such expenses require income to sustain, which is done by limiting access to free content and charging for full access.

Recently, a relative new decentralized encyclopedia, Wikipedia, has overtaken Encyclopedia Britannica in number of views (according to Alexa.com, 1996). With millions of people editing, writing, and reading articles, no encyclopedia in history has had as many contributors, editors, and readers. However, besides the users themselves, no centralized editorial oversight exists. Anyone can write or delete whatever they choose. Most of the work and staffing is done on a volunteer basis, and hence requires minimal monetary resources to sustain. With all the content freely available, Wikipedia brings in enough income to run its operations through charitable donations.

Other encyclopedias have arisen in an attempt to find a middle ground between these two extremes of centralized and decentralized information sources. For example, the Encyclopedia of Earth allows for the creation of content by anyone approved onto the system. Approval is given based upon appropriate academic credentials within disciplines. Content is written and reviewed by experts before it is released to the public. Most of the editorial work is done on a voluntary basis, with a limited paid staff for overall management, allowing all content to be available at no cost to the pubic. This creates a hybrid model between a centralized and decentralized system by providing some editorial review and control, with content freely accessible to all.

With an array of available sources, users become responsible for assessing the credibility of these sources. This has again raised the issue of media credibility and an analysis of which factors influence the perceived credibility of information on the Web (Flanagin & Metzger, 2000; Fogg et al., 2001; Metzger et al., 2003a, 2003b; Wathen & Burkell, 2002). Many different aspects of a website may influence the perceived credibility of information presented.

Persuasion models have been developed historically to determine how individuals cognitively respond to information within a persuasive message. Various models, such as the Heuristic–Systematic Model (Chaiken & Eagly, 1989; Chen & Chaiken, 1999) and Yale Model (Hovland et al., 1953) have been proposed. We chose to frame this experiment around the elaboration likelihood model (Petty et al., 2002, 1994; Petty & Cacioppo, 1979, 1986). In the context of our study, the elaboration likelihood model discusses two methods that can be incorporated into a website to persuade readers that the information is credible. These are a central route and peripheral route (Petty & Cacioppo, 1986). The central route requires users to carefully scrutinize the message and to determine the merits of the arguments. The elaboration likelihood model argues that the central route to persuasion should be utilized if the message recipient is highly motivated (Petty & Cacioppo, 1979) and/or readily able to comprehend the message (Petty et al., 1976). The peripheral route does not require the user to analyze the message or the argument extensively, but often relies on visual characteristics or other cues embedded in the message. The peripheral route may be optimal if elaboration likelihood (i.e., the likelihood of recipient motivation and/or ability) is low.

Fig. 2. A screenshot of the instructions and initial questions provided to the subjects in the experiment.

This research does not test the elaboration likelihood model, *per se*, but utilizes the idea that peripheral persuasion cues may affect a user's perception of credibility of an online encyclopedia article. The core proposition states that the perceived credibility of an article's content may be affected by the environmental characteristics of the message (Petty et al., 1994). The five peripheral persuasion cues assessed within this study are: (1) presence or absence of an identified author (i.e., Dr. Robert Corell, a leading climate scientist), (2) presence or absence of references (i.e., mostly peer-reviewed journals, shown right below the article), (3) presence or absence of a biased sponsor (i.e., Exxon Mobil), (4) presence or absence of an award given to the encyclopedia (i.e., by the Geoscience Information Society), and (5) whether the article is designated as appearing in Encyclopedia Britannica, Wikipedia, or Encyclopedia of Earth. These five peripheral cues, we hypothesize, potentially affect a user's perception of an article's credibility separate from the merits of the argument itself. Specifically, if the peripheral route to persuasion is operating, then perception of credibility may be increased by:

- Hypothesis 1: the presence of an author,
- Hypothesis 2: presence of references,
- Hypothesis 3: absence of a biased sponsor,
- Hypothesis 4: presence of an award, and
- Hypothesis 5: the source being given as Encyclopedia Britannica (as opposed to Wikipedia, or the Encyclopedia of Earth).

Because this study was interested in peripheral persuasion cues as opposed to utilizing the central route, the content of the encyclopedia was experimentally controlled by keeping it identical in all three encyclopedias.

2. Method

We empirically tested the peripheral cue hypotheses by experimentally manipulating each of the five cue variables. Altogether, testing the five cue factors implies constructing $2 \times 2 \times 2 \times 2 \times 3 = 48$ treatment combinations (or permutations). Rather than test across such a large number of combinations, we elected instead to conduct a test employing a 100% D-efficient[1] orthogonal design, one in which only 12 treatment combinations were formed.

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[1] Efficiency refers to the goodness of an experimental design, where an efficient design has small variance matrices Kuhfeld (2005). "Experimental design, efficiency, coding, and choice designs." *Marketing research methods in sas: Experimental design, choice, conjoint, and graphical techniques*: 47–97.

Items	Factor Loadings	
The article is trustworthy.	0.8514217	0.169214
The article is believable.	0.8077639	0.2139226
The article is reliable.	0.8544381	0.2218269
The article is authoritative.	0.638084	0.3524634
The article is accurate.	0.8311439	0.2118633
The article is valuable.	0.706547	0.4341594
The article is informative.	0.666491	0.4232142
The article is professional in content.	0.705992	0.3839416
The article is attractive in appearance or layout.	0.0666675	0.6406821
This article is involving.	0.1523915	0.7848105
The article is bold.	0.0559955	0.7471338
The article is interesting.	0.1773171	0.6714209
The article is sophisticated.	0.3461324	0.6041722
The article is unbiased.	0.529292	0.2086719
The article is well-organized.	0.3079303	0.5592731
The article is persuasive.	0.2039555	0.6415641
The article demonstrates expertise in the subject matter.	0.6773672	0.4402732
The article is well-written.	0.4026998	0.6358269

Fig. 3. The items and factor loadings from a varimax rotation.

Participants (i.e., subjects) in the experiment consisted of 936 members of academia, including freshman (171), sophomores (187), juniors (177), seniors (105), graduate students (145), post-docs (27), and professors (124) (Fig. 1). The participants were 53% female, with 58% from the social sciences, 38% from the natural sciences, and 4% from the humanities. Participants came from 100 different universities, with the majority (94%) based in the United States.

The experiment was distributed to participants via email. The email directed visitors to a website that contained instructions, a link to one of the twelve encyclopedia article combinations, and the questions. Fig. 2 offers a screenshot of the instructions and initial questions provided to the participants.

The participants were randomly assigned to one of the twelve encyclopedia combinations and asked to answer a set of 37 questions after reading the article (Appendix A). The 37 questions included thirteen regarding the participants' backgrounds, six about their standard Internet practices, and 18 questions regarding their perception of the specific article. The six Internet practice and eighteen perception questions were measured on a seven-point scale ranging from 1 = "strongly disagree" to 7 = "strongly agree."

3. Results

Subjects were asked a relatively large set of questions (i.e., 18 items) about their perceptions of the encyclopedia article used in the experiment because it was not clear à priori which individual item or set of items might best operationalize the construct of perceived credibility. An exploratory, principal components factor analysis was conducted as a means of tentatively establishing whether the perception items reflect one, or multiple, underlying constructs. Two factors, accounting for almost 60 percent of the variance, were retained based upon having eigenvalues greater than one (Churchill, 2004). To interpret the factors, we performed an orthogonal rotation, using the varimax procedure and inspecting for factor loading values of 0.5 or greater (Fig. 3). Based on the pattern of loadings, we interpreted Factor 1 as a "credibility" factor, that is, the extent to which the article was perceived as: reliable, trustworthy, accurate, believable, valuable, professional in content, demonstrating expertise in the subject matter, informative, authoritative, and unbiased. We interpreted Factor 2 as a "presentation" factor, that is, the perception that the article was: involving, bold, interesting, persuasive, attractive in appearance, well-written, sophisticated, and well-organized. In the regressions reported below, aggregate factor scores were calculated as linear combinations of the standardized values of the items factored.[2]

We empirically tested the peripheral cue hypotheses by running multivariate regression models utilizing the five cue variables as independent variables, and the two factors as dependent variables. The independent variables were coded using standard dummy (i.e., indicator) variable coding. Detailed results from the multivariate regression models, with the two aggregate factors used as dependent variables, can be found in Appendix B. Fig. 4 is provided to facilitate interpretation, with the shadings indicating levels of significance, and patterning indicating negative versus positive results. (Note: Fig. 4 and Appendix B also show the regression results for each of the eighteen items used separately as dependent variables). To summarize the findings: the regression using the aggregate "credibility" factor as the dependent variable is statistically significant overall, with the beta coefficients to the bias sponsor and encyclopedia cue variables significant individually. The regression using the aggregate "presentation" factor as dependent variable does not attain statistical significance. Thus, the cues appear to be related to perceived credibility but not presentation. Consequently, the remainder of the paper focuses only on the credibility regression.

3.1. Influence of the peripheral cue variables

As discussed above, the five cue variables used to construct the twelve different treatment combinations were: (1) presence or absence of an identifiable author, (2) presence or absence of references, (3) presence or absence of a biased sponsor, (4) presence or absence of an

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[2] In addition to an orthogonal rotation, we also conducted a promax (oblique) rotation, to see if the results changed after allowing for factor correlation. The pattern of loadings suggested a substantively identical interpretation, with the same underlying "credibility" and "presentation" factors. Moreover, when we tested the peripheral cue hypothesis by running the regression models with factor scores calculated from a promax rotation, the signs and statistical significance levels of the parameter estimates were substantively identical with those obtained when a varimax rotation was employed.
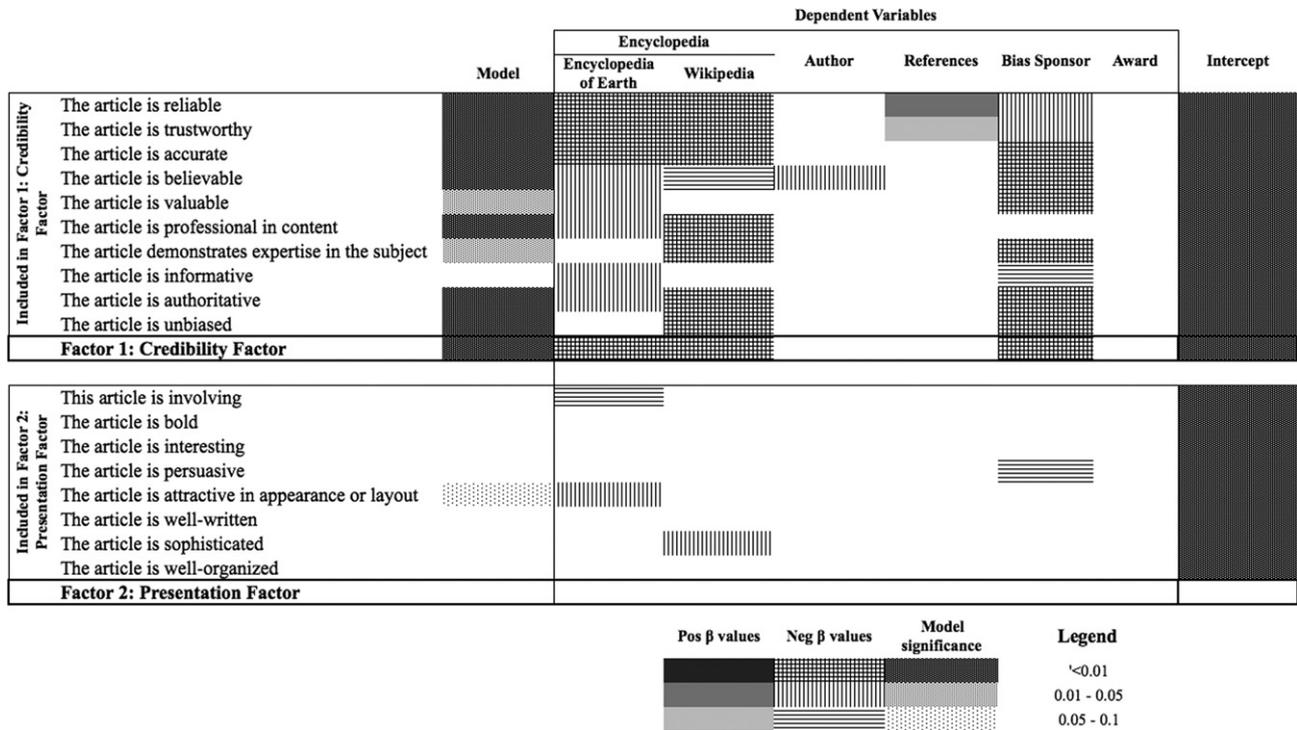
Fig. 4. Illustrates the significant statistical results for the aggregate credibility and presentation factors as dependent variables (along with individual items as dependent variables). To facilitate interpretation, shading indicates level of significance, and coloration indicates negative versus positive results. A more detailed report of the findings can be found in Appendix B.

award, and (5) whether the article is designated as appearing in Encyclopedia Britannica, Wikipedia, or Encyclopedia of Earth. The presence of a biased sponsor ($\beta = -0.2188$, t Ratio $= -3.37$, $P = 0.0008$) had a significant negative effect on the aggregate credibility factor. The encyclopedia in which the article was designated to have appeared in also significantly affected the credibility factor. Recall that the content of the article was identical in all cases. Relative to Encyclopedia Britannica, which served as the arbitrary reference (or baseline) encyclopedia in the analyses (i.e., the omitted dummy variable in the regressions), the designation of the article as appearing in Encyclopedia of Earth ($\beta = -0.2531$, t Ratio $= -3.09$, $P = 0.002$) or Wikipedia ($\beta = -0.3837$, t Ratio $= -5.01$, $P = <0.0001$) had a significantly negative effect on perceived credibility. The other primary variables, including author, references, and award, did not significantly influence the credibility factor. None of the five cue variables were significantly related to the presentation factor.

3.2. Check for other potential influences on perceived credibility

To test the validity of the regression involving the credibility factor, various aspects of the participants' backgrounds were considered as potential influences. These included the status of the subjects as students or faculty, age, gender, discipline, how many hours they spend on the Internet a week, and whether they've taken a course on how to use the Internet. Regressions were performed in which these background variables were included as independent variables along with the five primary cue variables.

The only background variable significantly related to perceived credibility was whether the individual was a freshman ($\beta = 0.1854$, t Ratio $= 2.23$, $P = 0.0260$), suggesting that there may be a certain amount of learned knowledge of how to assess the credibility of Web-based information. However, inclusion of this variable in the regression produced no substantive change in the coefficient estimates or significance levels of the other parameters. None of the other background variables played a significant role in explaining perceived credibility.

An additional set of belief questions asked subjects whether they felt that they were knowledgeable about the subject area of the article (i.e., climate change), whether they believed that human activities seriously influenced climate change, and whether they felt that strong environmental policies were needed to deal with human-made climate change. None of the belief variables were significantly related to the credibility factor.

4. Discussion

This study addresses whether peripheral cues associated with a webpage affect perceptions of the credibility of the presented (online) information. The subject of peripheral cues and their influence is important because academics and students are increasingly utilizing Web-based information for course work and research (Browne et al., 2000), yet the quality and reliability of much of this information is of questionable accuracy or reliability (Fitzgerald, 1997; Hernon, 1995).

Results of the study demonstrate that one of the most significant influences on perceptions of an online article's credibility is the subject's belief about the identity (i.e., name) of the encyclopedia presenting the information (Fig. 4, Appendix B). We found that subjects exposed to

a climate change article designated as appearing in Wikipedia or Encyclopedia of Earth evaluated the information as significantly less credible than those exposed to the same information designated as appearing in Britannica.

Such results may be due to brand equity. Employed variously by different authors, one widely used conceptualization of brand equity defines it as a customer mind-set construct, specifically a heightened level of attachment, awareness, attitude, or customer goodwill generated by the brand name identity (Ailawadi et al., 2003). So, for example, Aaker (1991) refers to the positive (or negative) effect that a brand has on a consumer's perception of a product as a result of the brand being associated with it versus an identical product with no brand identity (or perhaps a different brand identity). Or, as Raggio and Leone state, brand equity is a perception that a brand will satisfy a "salient promise" of benefits. In this study, the core "product" was the climate change article, which was then surrounded by a bundle of peripheral cues, including one of three brand names associated with it: Encyclopedia Britannica, Encyclopedia of Earth, or Wikipedia. If consumers are unable to completely separate the product from the brand name, they may well be influenced by prior knowledge and image of the brand (Leuthesser et al., 1995).

Britannica's very long publication history has produced a high level of awareness (and, to an unknown extent, residual goodwill) toward the publication. By contrast, much negative media publicity surrounding Wikipedia may have decreased its brand equity in recent years (Cohen, 2007; Hafner, 2007; Seelye, 2005). This has especially penetrated academia, where many instructors do not allow students to cite Wikipedia as a reference in papers (Cohen, 2007). Encyclopedia of Earth is a relatively new, less known, source of information, and insufficient time may have elapsed for it to have leveraged any positive equity developed as a result of its editorial policies or standards (Yoo et al., 2000).

For the majority of its existence, Encyclopedia Britannica was the most accessible encyclopedia available through libraries and bookstores. However, that has changed in recent years. Encyclopedia Britannica requires users to pay for much of the content while new, alternative Internet encyclopedias such as Wikipedia and Encyclopedia of Earth are free. As a consequence, although brand equity is important, it may not be sufficient to induce users to pay for online content indefinitely into the future, especially when similar (albeit less credible) information can be found elsewhere on the Web for free (Dou, 2004; Wang et al., 2005).

The other major variables evaluated in the study were the presence or absence of an author, references, biased sponsor, and a site award. The results indicate that in addition to encyclopedia brand, the presence of a biased sponsor had a significant effect on perceived credibility. The biased sponsor, Exxon Mobil, was chosen because it was believed that the overwhelming majority of subjects would recognize the company's name, and have some knowledge of its business without engaging in an external search. The fact that the presence of a named author was not found to have a significant effect on perceived credibility may demonstrate that the participants do not generally investigate the background of the author when looking at Web-based information. However, because there was no affiliation associated with the author in our study, and the author was not know globally, participants may have considered the statement of a name only to be irrelevant. This could also explain the lack of significance in the presence of a site award. The award was designated as coming from the Geoscience Information Society, and was intended to imply a certain quality in the content of the encyclopedia's articles. However, since the Geoscience Information Society isn't an organization with a well-known brand name, it may have been deemed irrelevant by participants. The use of references also had no significant influence on the perception of credibility. This could be due to the fact that the article, regardless of the presence of references, had internal hyperlinks spread throughout the text. These could have been viewed as references even though they would have only linked to other articles within that website. The finding that the references to peer-reviewed articles at the bottom of the page did not significantly influence perceived credibility may also demonstrate that when reading basic and general online information, peer-reviewed references are not seen as critical. Future research on perceived credibility might benefit from exploring different operationalizations of these possible explanatory cue factors.

5. Conclusion

The experiment presented in the paper was designed to show whether certain webpage characteristics affect academics' and students' perception of the credibility of information presented in an online article. The experiment looked at five peripheral cues: (1) presence or absence of an identifiable author, (2) presence or absence of references, (3) presence or absence of a biased sponsor, (4) presence or absence of an award, and (5) whether the article is designated as appearing in Encyclopedia Britannica, Wikipedia, or Encyclopedia of Earth. The results indicate that compared to Encyclopedia Britannica, article information appearing in both Encyclopedia of Earth and Wikipedia is perceived as significantly less credible. The results also indicate that the presence of a biased sponsor has a significant negative effect on perceived credibility.

Appendix A. Experiment questions

Background questions
1. What is the red number at the top of your article?
2. What is your gender?
3. How old are you?
4. Which of the following describes your student or faculty position?
5. What is the name of the university or college with which you are affiliated?
6. What is your major or professional discipline?
7. On average, how many hours a week do you spend using the Internet/WWW?
8. If you live in the United States, what is your zip code of your permanent address?
9. Have you ever taken a course on how to use the Internet or had it as part of another course? (Yes/No)
10. How often have you used this online encyclopedia before? (where 1 = 'never' to 7 = 'all the time')

11. I am very knowledgeable about the topic of climate change. (where 1 = 'strongly disagree' to 7 = 'strongly agree')
12. I believe that the activities of humans (e.g., driving cars, industrial manufacturing, agricultural efforts, etc.) seriously influence climate change. (where 1 = 'strongly disagree' to 7 = 'strongly agree')
13. I believe that strong environmental policies are needed to deal with human-made climate change. (where 1 = 'strongly disagree' to 7 = 'strongly agree')

Internet practice questions
14. I always try to verify that the information I obtain from an online encyclopedia is correct. (where 1 = 'strongly disagree' to 7 = 'strongly agree')
15. I always try to identify the author of an online encyclopedia article. (where 1 = 'strongly disagree' to 7 = 'strongly agree')
16. I always seek out other sources to validate information that I find in online encyclopedias. (where 1 = 'strongly disagree' to 7 = 'strongly agree')
17. I always try to determine whether the information in an online encyclopedia is biased. (where 1 = 'strongly disagree' to 7 = 'strongly agree')
18. When reading an online encyclopedia article, I always try to consider the author's goals and objectives in compiling the information. (where 1 = 'strongly disagree' to 7 = 'strongly agree')
19. When reading an online encyclopedia article, I always look for an award or some other external source of recognition validating the information contained in the article. (where 1 = 'strongly disagree' to 7 = 'strongly agree')

Article Perceptions Questions
20. The article is trustworthy. (where 1 = 'strongly disagree' to 7 = 'strongly agree')
21. The article is believable. (where 1 = 'strongly disagree' to 7 = 'strongly agree')
22. The article is reliable. (where 1 = 'strongly disagree' to 7 = 'strongly agree')
23. The article is authoritative. (where 1 = 'strongly disagree' to 7 = 'strongly agree')
24. The article is accurate. (where 1 = 'strongly disagree' to 7 = 'strongly agree')
25. The article is valuable. (where 1 = 'strongly disagree' to 7 = 'strongly agree')
26. The article is informative. (where 1 = 'strongly disagree' to 7 = 'strongly agree')
27. The article is professional in content. (where 1 = 'strongly disagree' to 7 = 'strongly agree')
28. The article is attractive in appearance or layout. (where 1 = 'strongly disagree' to 7 = 'strongly agree')
29. This article is involving. (where 1 = 'strongly disagree' to 7 = 'strongly agree')
30. The article is bold. (where 1 = 'strongly disagree' to 7 = 'strongly agree')
31. The article is interesting. (where 1 = 'strongly disagree' to 7 = 'strongly agree')
32. The article is sophisticated. (where 1 = 'strongly disagree' to 7 = 'strongly agree')
33. The article is biased. (where 1 = 'strongly disagree' to 7 = 'strongly agree') [reverse coded]
34. The article is well-organized. (where 1 = 'strongly disagree' to 7 = 'strongly agree')
35. The article is persuasive. (where 1 = 'strongly disagree' to 7 = 'strongly agree')
36. The article demonstrates expertise in the subject matter. (where 1 = 'strongly disagree' to 7 = 'strongly agree')
37. The article is well-written. (where 1 = 'strongly disagree' to 7 = 'strongly agree')

Appendix B. Experiment results

The table summarizes the regression results using the credibility and presentation factors as dependent variables (the regressions with individual items as dependent variables are shown as well). Encyclopedia Britannica is the omitted or baseline dummy variable in the encyclopedia coding scheme. Values in Bold are overall factor results.

Dependent variables	Model R^2	Prob > F	Encyclopedia of Earth β	t Ratio	Prob > |t|	Wikipedia β	t Ratio	Prob > |t|	Author β	t Ratio	Prob > |t|	References β	t Ratio	Prob > |t|	Bias sponsor β	t Ratio	Prob > |t|	Award β	t Ratio	Prob > |t|	Intercept β	t Ratio	Prob > |t|
Included in Factor 1: Credibility Factor																							
The article is reliable	0.0513	<.0001	−0.43351	−3.47	0.0005	−0.72778	−6.22	<.0001	−0.10447	−1.06	0.2914	0.22288	2.26	0.0241	−0.20084	−2.03	0.0431	0.11382	1.15	0.2508	4.92313	37.77	<.0001
The article is trustworthy	0.0321	<.0001	−0.33286	−2.78	0.0055	−0.51339	−4.59	<.0001	−0.08719	−0.92	0.3576	0.17648	1.87	0.0619	−0.20619	−2.17	0.0301	0.08892	0.94	0.3486	4.95511	39.72	<.0001
The article is accurate	0.0371	<.0001	−0.39545	−3.54	0.0004	−0.44805	−4.28	<.0001	−0.04099	−0.48	0.6437	0.06667	0.76	0.4504	−0.34319	−3.87	0.0001	0.09123	1.03	0.3038	5.11173	43.81	<.0001
The article is believable	0.0213	0.0027	−0.27303	−2.48	0.0132	−0.17757	−1.73	0.0848	−0.19041	−2.19	0.0290	0.01478	0.17	0.8648	−0.26261	−2.89	0.0039	0.09763	1.12	0.2629	5.51472	48.08	<.0001
The article is valuable	0.0161	0.0195	−0.29704	−2.30	0.0216	−0.18980	−1.57	0.1167	−0.11567	−1.13	0.2584	0.09286	0.91	0.3625	−0.28160	−2.75	0.0061	0.06789	0.66	0.5074	4.95037	36.75	<.0001
The article is professional in content	0.0279	0.0002	−0.25989	−2.07	0.0387	−0.55852	−4.75	<.0001	−0.11076	−1.11	0.2658	0.11534	1.16	0.2449	−0.10014	−1.00	0.3154	0.06604	0.66	0.5073	5.30804	4.52	<.0001
The article demonstrates expertise in the subject matter	0.0168	0.0150	−0.15268	−1.33	0.1852	−0.31240	−2.89	0.0039	−0.05579	−0.61	0.5415	0.04077	0.45	0.6544	−0.24759	−2.70	0.0070	−0.07369	−0.81	0.4204	5.26153	43.74	<.0001
The article is informative	0.0111	0.1088	−0.24579	−2.16	0.033	−0.5709	−0.53	0.5928	−0.08370	−1.04	0.2997	0.03579	0.40	0.6910	−0.18596	−2.05	0.0402	0.03068	0.34	0.7343	5.55866	46.74	<.0001
The article is authoritative	0.0377	<.0001	−0.31949	−2.49	0.0131	−0.62943	−5.23	<.0001	−0.01447	−0.14	0.8871	0.15662	1.54	0.1232	−0.27073	−2.65	0.0081	0.10252	1.01	0.3148	4.81266	35.88	<.0001
The article is unbiased	0.0194	0.0056	−0.19222	−1.43	0.1522	−0.36667	−2.92	0.0036	−0.04804	−0.45	0.6514	0.07926	0.75	0.4544	−0.34152	−3.21	0.0014	−0.02335	−0.22	0.8263	4.81686	34.41	<.0001
Factor 1: Credibility Factor	**0.0399**	**<.0001**	**−0.25308**	**−3.09**	**0.0020**	**−0.38373**	**−5.01**	**<.0001**	**−0.07168**	**−1.11**	**0.2688**	**0.06268**	**0.97**	**0.3319**	***−0.21880***	**−3.37**	**0.0008**	**0.07513**	**1.16**	**0.2470**	**0.29189**	**3.42**	**0.0007**
Included in Factor 2: Presentation Factor																							
The article is involving	0.0079	0.2896	−0.21071	−1.79	0.0742	−0.14807	−1.34	0.1801	−0.14241	−1.52	0.1276	0.01939	0.21	0.8350	−0.09556	−1.02	0.3075	−0.04460	−0.48	0.3664	4.32081	35.13	<.0001
The article is bold	0.0024	0.8964	−0.01168	−0.10	0.9233	−0.11837	−1.04	0.2981	−0.05603	−0.58	0.5604	0.6536	0.68	0.4956	−0.01682	−0.17	0.8615	−0.02519	−0.26	0.7937	3.79507	29.95	<.0001
The article is interesting	0.0022	0.9168	−0.08080	−0.64	0.5236	0.07557	0.6	0.5241	−0.01533	−0.15	0.8786	0.05417	0.54	0.5881	0.01921	0.19	0.8485	−0.00632	−0.06	0.9498	4.44828	33.66	<.0001
The article is persuasive	0.0070	0.3665	−0.023089	−0.23	0.8444	−0.04960	−0.45	0.6523	−0.09042	−0.97	0.3318	0.12626	1.36	0.1740	−0.17926	−1.92	0.0550	−0.05409	−0.58	0.5618	4.24763	34.63	<.0001
The article is attractive in appearance or layout	0.0131	0.558	−0.29591	−2.52	0.0118	0.02059	0.19	0.8512	0.04217	0.45	0.6499	0.07482	0.81	0.4192	−0.10737	−1.15	0.2490	−0.08712	−0.94	0.3490	5.13497	41.98	<.0001
The article is well-written	0.0052	0.5666	−0.14250	−1.26	0.2069	−0.09732	−0.92	0.3572	−0.10380	−1.16	0.2458	0.06953	0.78	0.4353	−0.9079	−1.01	0.3110	0.01486	0.17	0.8681	4.99697	42.45	<.0001
The article is sophisticated	0.0087	0.2300	−0.06795	−0.72	0.4746	−0.25546	−2.22	0.0267	−0.02101	0.22	0.8293	0.5548	0.57	0.5678	−0.16607	−1.70	0.0892	0.04161	0.43	0.6696	4.46182	34.78	<.0001
The article is well-organized	0.0072	0.03499	−0.8573	−0.78	0.4358	0.14221	1.38	0.1675	0.02151	0.25	0.8050	0.07454	0.86	0.3908	−0.04743	−0.54	0.5871	−0.08181	−0.94	0.3484	4.97276	43.34	<.0001
Factor 2: Presentation Factor	**0.0036**	**0.7582**	**−0.04296**	**−0.52**	**0.6062**	**0.06343**	**0.81**	**0.4163**	**−0.02883**	**−0.44**	**0.6623**	**0.05352**	**0.81**	**0.4161**	**−0.01088**	**−0.16**	**0.8694**	**−0.05238**	**0.79**	**0.4280**	**4.46182**	**0.08**	**0.936**

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