**Digital Media Attention
and Cognition Lab**

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THE SEARCH FOR CREDIBILITY:
What users evaluate, view, and miss when assessing credibility of online news web sites

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The Trust Project

SUMMARY

In order to help guide future research in understanding the impact of some of the Trust Project's Trust Indicators in online news articles on feelings of credibility, an in-person eye-tracking experiment was conducted (N=79). This study examined how users form online news credibility assessments of online news websites by combining several measurements of user behavior: 1) visual attention to certain elements on article pages and 2) page viewing across the site itself. Each participant read two investigative news articles (out of a pool of 6) each of which varied in length and subject, while having their gaze recorded by an eye tracker. After participants completed reading each article, they answered a series of questions about the article and website. Results showed that online news credibility determinations are a multifaceted process consisting of browsing and weighing numerous information factors. Our findings showed that when users saw transparency indicators, it led to a positive impact on credibility.

KEY FINDINGS

- Of three types of Trust Indicators included on the article pages, study participants spent the most time viewing journalist transparency elements, followed by best practices elements and label elements.

- Users who viewed best practices elements on the article page rated the news article as more credible, and the news organization as more valuable to its audience.

- Users who perceived the news as more biased were more likely to spend time viewing pages related to policies and procedures. Users who had lower levels of procedural news knowledge were more likely to spend their time browsing article pages.

BACKGROUND

Perceived trust in news organizations is declining globally across platforms, from traditional media to new media. Feelings of trust are often associated with perceived credibility of news organizations, and the most significant decline in news trust is seen in consumers' evaluation of online news credibility specifically[13]. There are an increasing number of avenues for consumers to discover news content online. Navigating these digital spaces can be challenging for average consumers to identify whether the information they are viewing comes from a credible source.[14] A 26-country analysis from 2016 and 2019 found that increased social media use was a significant contributing factor in a decline in trust in news media generally across the globe, and research shows that feelings of mistrust in news are predicted to increase as global social media usage increases in number of users and average time spent on these platforms.[15]

In order to address some of these concerns regarding perceptions of credibility,

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[13] (Park, Fisher, Flew, & Dulleck, 2020)
[14] (Vraga & Tully, 2021)
[15] (Park et. al, 2020)

news organizations all over the world are testing strategies to combat low perceived credibility. These strategies prioritize the understanding that increased levels of transparency and public accountability can translate to increased feelings of credibility towards the information and the publishing outlet.[16] However, because news consumers are adopting more "generalized skepticism" toward digital information, specifically articles and news links shared on social media,[17] researchers have recommended that journalists enhance the quality of their reporting by integrating explanations of news gathering methods, source vetting and corroboration of facts in order to counter mistrust.[18] By increasing efforts to showcase transparency in news reporting, this can lead to increased feelings of credibility once consumers are presented with these indications of transparent, fair and balanced reporting[19] , such as author information[20] and article labels[21] . One organization focused on journalistic transparency, The Trust Project, includes multiple transparency initiatives as part of eight "Trust Indicators" or practices that news organizations can engage in to foster trust among their audiences. Three of these are defined as best practices, journalist expertise, and labeling.

The presence of these journalistic transparency elements may lead users to more positive evaluations of a given story or a news website,[22] but such elements can only be effective if users notice them.[23] In order to undertake a more systematic approach to studying the extent to which news readers notice and pay attention to journalistic transparency elements, this study posed the following research questions:

1. To what extent do news consumers pay attention to these three Trust Indicators when reading an article?

2. When given 3 minutes to browse a live news website before assessing its credibility, what areas of the site do news consumers view?

3. How do users' visual attention and page viewing behavior influence their feelings of credibility and value of the news organization?

4. What influences news readers' feelings of credibility, in their own words?

METHOD

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16   (Newman & Fletcher, 2017)
17   (Fletcher & Neilson, p. 1765)
18   (Henke et. al, 2020)
19   (Curry & Stroud, 2021)
20   (Waddell, 2019)
21   (Peacock, Masullo, & Stroud, 2022)
22   (Curry & Stroud, 2021)
23   (Masullo et al, 2021)

To test the effects of several Trust Indicators® on news readers and whether readers noticed them, we conducted an in-person experiment in which each participant read one news article and then were asked to spend three minutes browsing the website of the corresponding news organization. Participants answered a series of questions about their perceptions of the article and publication after each article. A total of six different articles used in the study, with each participant randomly assigned to read two of them. While participants read each site, an eye tracker was attached to the computer screen collecting data on where users looked on each screen.

PARTICIPANTS

A total of 79 U.S. adults were recruited and successfully took part in the study. Participants were recruited from the University of Georgia and surrounding communities. Participants ranged in age from 18 to 66 years of age, and the mean age was 30.7 years old. Sixty-four percent of participants were female, and 50 percent of participants had received at least a bachelor's degree. Both of these populations were overrepresented compared to the general U.S. population. 71.4 percent of participants reported some white or Caucasian ancestry, 12.7 percent of participants reported Asian or Asian American ancestry, 11.8 percent participants reported Black or African American ancestry, with 6 percent or fewer reporting Native American, Native Hawaiian, or Native American ancestry. A total of 7.6 percent of participants identified as Hispanic or Latino. All participants were 18 years or older. Each participant was randomly assigned to read two articles.

MATERIALS

Participants were asked to click on the randomly-assigned news article link by way of a constructed Facebook newsfeed. Even though there were six different articles being randomly assigned one at a time, the Facebook newsfeeds were otherwise identical to one another. The six articles came from six different news organizations, all of which are participating partners in The Trust Project. The organizations were: The Toronto Star, the Washington Post, the Denver Post, Wisconsin Watch, iNewsource, and CTV News.

Each article from these organizations was chosen based on relative currency of the topic while we conducted the study, as well as the news organization's reliance on investigative reporting over time rather than coverage of a single event.

The articles chosen were"Kids in Colorado's juvenile detention centers don't always get needed medication, advocates say (Denver Post)," "Canada's public pension plan has invested millions in Chinese companies blacklisted in the U.S.

over security concerns (Toronto Star)," "FEMA offers generous federal aid to those grieving COVID-19 Deaths. Getting it isn't easy (Wisconsin Watch)," "Boom-and-bust federal funding after 9/11 undercut hospitals' preparedness for pandemics (Washington Post)," "Scientists warn extreme heat wave that preceded Lytton fire may not be isolated event (CTV)," and "San Diego region slow to send rent, utility relief to struggling tenants facing eviction (iNewsource)."

STUDY PROCEDURE

Example Investigative Journalism Target Articles

Participants arrived at the DMAC Lab on the University of Georgia campus, and were presented with a written consent form that explained the study. After providing consent, they were led into the lab and seated at a desk that contained a 23-inch monitor, mouse, and keyboard. A Tobii Pro Nano eye tracker was mounted on the bottom of the computer monitor. The research guided participants through a brief eye-tracker calibration task. One calibration was achieved, participants were given instructions for the first of the two articles they would view. Participants were told that they would see a constructed Facebook page containing one post featuring a news article, and that they should click the post to view the article, and read the article as they would if they were reading it on their own. They were told to let the researcher know when they'd finished reading the article.

When participants indicated they were finished, the researchers gave them the following instructions: "Before we ask you some questions about the credibility of the article and the news website, we'd like to give you some additional time to browse the site. We'd like to give you 3 additional minutes to browse the site however you wish. You can click any links you want, but please try to stay on this website during the 3 minutes. Once the 3 minutes are over, we will load the questionnaire for you."

The specific articles that participants read varied across experimental condition. Each participant was randomly assigned to one of six conditions that differed across which articles they would be asked to read, and in which order. Each of the six conditions contained a different pairing of two articles, and each article was first in presentation order in one condition, and second in presentation order in another condition.
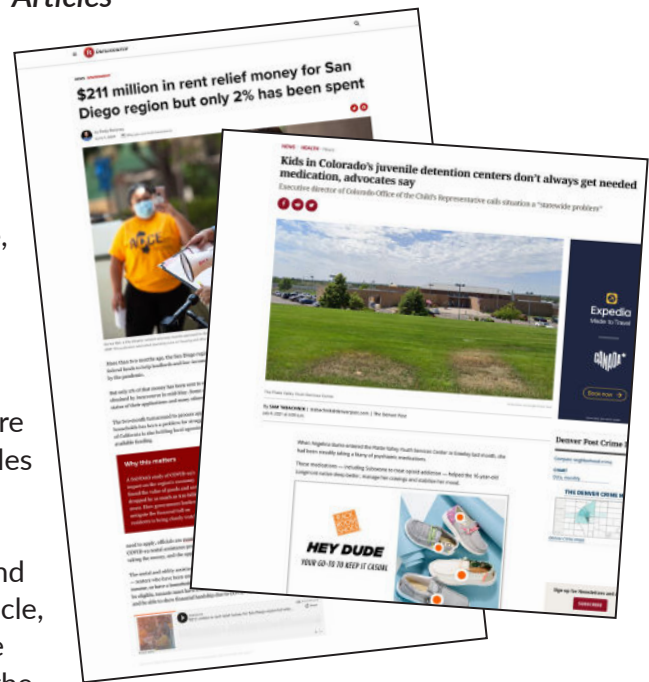
WHAT WE MEASURED

In order to capture information about how participants viewed the news websites, we used eye-tracking hardware and software that allowed us to capture data from the duration of participants' website use. All the participants' browser activity, such as page views and scrolling, was captured in full-resolution video with a timestamp using the Tobii Pro Lab software. Additionally, the location and duration of participants's visual gaze was captured by the eye tracker mounted on the computer monitor, which recorded the vertical and horizontal position of the gaze of each eye at a sampling rate of 60 samples per second. The screen recording data and eye-tracking data was used to create several key measures in our study:

Time spent reading main article: This measure was logged by members of the research team from video recordings, starting with the second the page was fully loaded, and ending with the moment participants indicated they were done reading the article. The times were subtracted to create a measure of time spent with the main article (in milliseconds).

Time spent viewing pages on the site. To examine and categorize what content on web sites users viewed during their 3-minute browsing time, two trained coders went through each participant's browse time recording and noted the start time and end time for each page the participant viewed in the three minutes after they finished reading the article and received the browsing instruction. Coders recorded the time spent, page title, and URL of every page viewed, and categorized each page into one of five categories.

Each visit to the homepage of the site was counted as "Homepage", and each visit to an alternate page on the site that aggregated stories by topic or theme was coded as "Section Homepage." Time that participants spent visually scanning the target article page after they had indicated they were finished reading the article, along with time spent on any other single-article pages, was coded as "Articles." Any time spent viewing pages that addressed policies, procedures, funding, personnel, or other similar information about the news organization itself was categorized as "Policies." For participants who clicked on an informational link about The Trust Project, and were taken directly to The Trust Project website, time spent viewing information on the Trust Project website was coded as "Trust Project." Lastly, any remaining time spent viewing pages that were not able to be categorized into the above category was categorized as "Other."

Visual attention to label elements: Attention to label elements was measured by summing the total duration of participants' gaze time (in milliseconds) within the label elements on the site page across the four articles that included label elements. Each area was drawn as a series of rectangular coordinates around any specific elements on the page that served as a section or type label on the article.

For example, the iNewsource article featured a "type of work" label at the top of the page identifying the article as "News:Government," and a second box provided a definition: "News: based on facts, either observed and verified directly by the reporter or reported and verified from knowledgeable sources." Both of these label areas were summed to create a measure of attention to label elements on that article. Label elements ranged in number from 0 to 2 across the six websites in the study. Mean participant attention to label elements across sites was 3.99 seconds (SD = 6.51).

Visual attention to journalist expertise elements: Attention to journalist expertise elements was measured by summing attention duration to all the areas that contained information about the author (byline, biographies, etc). Each area of interest was drawn as a rectangular box encompassing the entirety of the element plus 5 additional pixels of padding on each site. Gaze data within each area of interest was processed using an I-VT fixation filter to classify eye movements, exported in milliseconds, and summed across the journalist expertise elements on a given website, which ranged in number from 0 to 3 across the six sites in the study. Mean attention to journalist expertise elements across sites was 6.10 seconds (SD = 8.34).

Visual attention to best practices elements: Attention to best practices elements was measured by summing attention duration to all the areas that contained journalistic best practices on the main article page. Across the sites, as required by The Trust Project, the majority of elements on the article pages that referred to best practices were navigation links that allowed the reader to access information about funding, content standards, reporting practices, and other information. Identified best practice links ranged in number across the article pages from 1 to 4. Mean visual attention to best practice links across participants was 4.00 seconds (SD = 6.46).

Article credibility was measured by asking participants to rate their agreement with how well a series of 15 adjectives or descriptions (balanced, objective, accurate, honest, believable, trustworthy, up-to-date, current, timely, told the whole story, respected people's privacy, could be trusted, separated facts from opinion, watches out for my interests, reports the whole story) applied to each article they read. The items were assessed for unidimensionality (alpha = .935), and averaged to form a single-item measure of article credibility (M=5.35, SD = 0.98).

News site credibility was measured by asking participants to rate their feelings of credibility and trustworthiness following each of the two articles they read (e.g. "How credible do you find this organization?", "How trustworthy do you find this organization?" on a 7-point scale ranging from from "not at all" to "extremely." The items were assessed for unidimensionality (alpha = .912) and averaged to create a single measure of news site credibility(M= 5.21, SD = 0.93).

Perceived value to the audience of the news organization was measured by asking participants to rate their agreement with three statements, "I think [Publication Name] serves the needs of its audience well; If I were in [Publication Name's] target market, I would be a regular reader; and If I were in [Publication Name's] target

market, I would be willing to pay to subscribe to its content. The three items (alpha= .700) were averaged to form a measure of perceived value to the audience (M = 4.62, SD = 1.20).

At the beginning of the study session, we also asked each participant to complete a questionnaire containing several measures of their pre-existing news knowledge and perceptions. The four things we sought to measure were: News following frequency, general news trust, procedural news knowledge, and perceived news bias.

News following frequency was measured using participants' responses to the question "How often do you follow the news" on a five-point scale ranging from "Never" to "All or Most of the time (M = 4.31; SD = 0.74)

General news trust was measured using a single item worded "Thinking about news in general, do you agree or disagree with the following statement: 'I think you can trust most news most of the time'? Participants rated their agreement on a 5-point scale ranging from "Strongly Disagree" to "Strongly Agree," (M = 3.01 SD = 0.95).

Procedural news knowledge was assessed using participants' responses to a series of five multiple-choice questions related to the U.S. news industry and practices[13]. Questions included "Which of the following U.S. news outlets does NOT depend primarily on advertising for financial support?" and "In what section does a newspaper's editorial staff endorse candidates and express their opinions about current issues?". Correct responses for the five items ranged from 77.2 percent correct to 89.9 percent correct. Participants' responses were assessed a "1" or "0" based on whether they selected the correct choice, and then summed to create an index of procedural news knowledge ranging from 0 to 5 (M = 4.23 , SD = 1.04).

Perceived news bias was measuring participants' responses to a single question, "To what extent do you see political bias in news coverage that you personally consume" on a seven-point scale ranging from 1 ("Not at All") to 7 ("A Great Deal") (M = 5.01; SD = 1.01)

RESULTS

Visual Attention to Transparency Elements

Our first question asked about participants' visual attention to journalistic transparency elements while reading the target article page. To examine differences between attention to the three specific types of journalistic transparency elements, paired-samples t-tests were conducted between each pair of elements.

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13   (Amazeen & Bucy, 2019)

Allocation of Total Browsing Time, in Seconds, by News Web Site
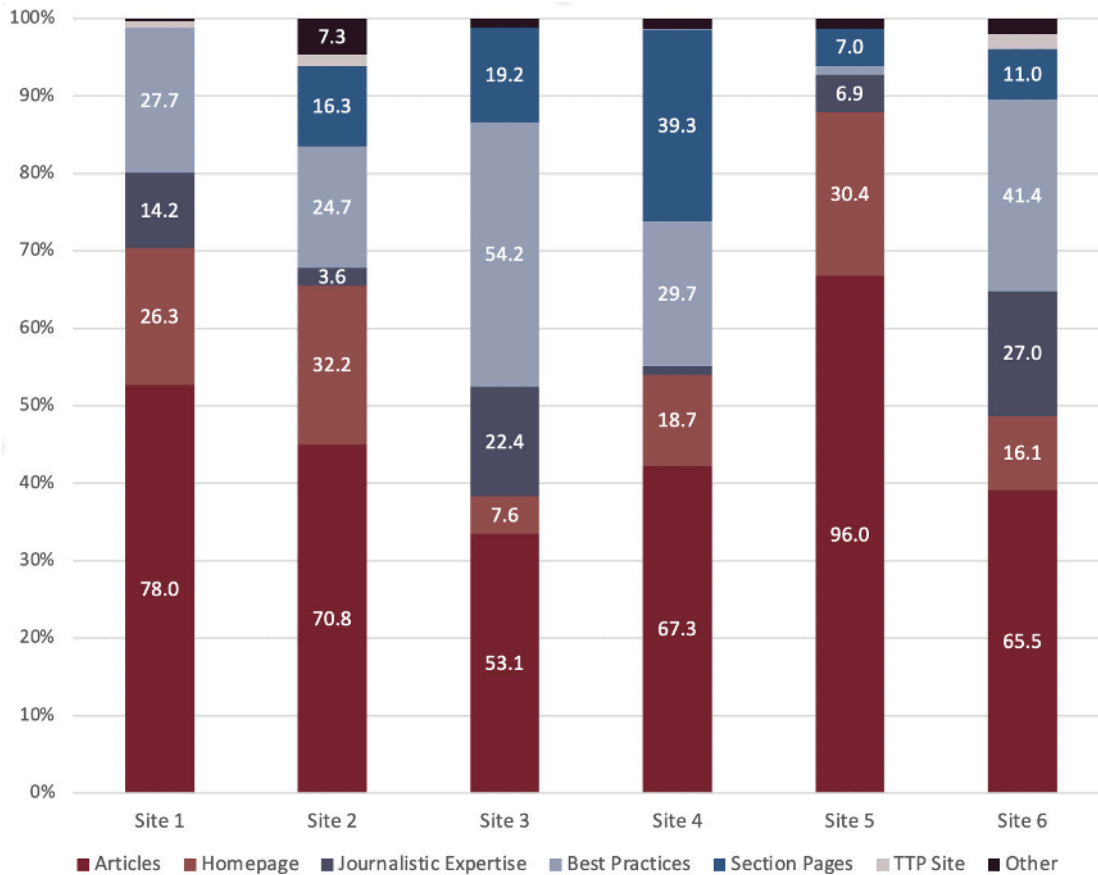
Overall, participants spent significantly more time viewing journalist expertise elements (M = 6.10 , SD = 8.34) than either best practices elements (M = 3.99 , SD = 6.51), t = -2.62, p = .010, or labeling elements (M=.082, SD = 1.91), t = 6.17, p < .001. Attention to best practices elements was also significantly greater than to labeling elements, t = 4.89, p < .001.

What Users Viewed When Assessing Credibility

Our first research question asked what pages within a news website viewers view when given time to assess the credibility of a live online news website. To examine this information, trained coders coded all the pages viewed during participants' viewing time. To assess whether differences spent in viewing between the sections were statistically significant, a series of paired samples t-test were run comparing the viewing time of each pairs of categories.

The results showed that news consumers spent more time viewing article pages (M = 72 sec; SD = 65.4) than policies and standards pages (M = 26.2 sec, SD = 48.8), t(144) = 5.38, p < .001, homepages (M = 22.2 sec, SD = 31.2), t(144) = 6.97, p < .001, section pages (M = 14.8 sec, SD = 34.3), t(144) = 8.61, p < .001, journalist expertise pages (M = 12.6 sec, SD = 28.74), t(144) = 8.61, p < .001, and uncategorized pages (M= 2.72 sec, SD = 10.70).

In addition, homepages t(144) = 2.27, p = .012 and best practice pages t(144) = 2.27, p = .012 were viewed significantly longer on average than journalist expertise pages, and all named page sections were viewed longer than "other" pages (all p-values < .001). The distribution of page viewing varied substantially across the six news websites.

Percentage of Journalistic Transparency Elements Viewed and Page Types Browsed By Participants
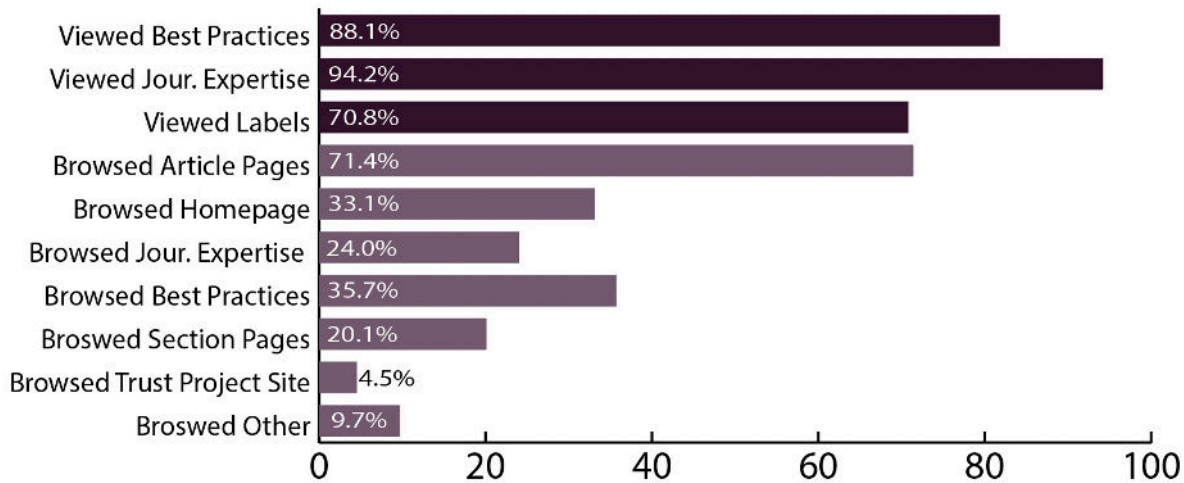
How User Behavior Predicts Credibility Perceptions

We also wanted to examine whether users' visual attention to elements on article pages and their page browsing behavior across the site were related to their evaluations of article credibility, news organization credibility, and perceived value to the audience.

First, we examined the relationship between news consumers' viewing behaviors and assessments of article credibility. A stepwise multiple regression analysis showed that while a model with only visual attention to journalism transparency elements was not a significant predictor of article credibility, the full model insluding the seven page browsing behaviors measures significantly predicted article credibility, F(8, 76) = 2.42, p = .044, R2 = .172. Specifically, two user behaviors predicted article credibility assessments, **visual attention to best practices elements**, Beta = .294, t = 2.02, p = .047, and **browsing of Policy and Standards pages** also predicted article credibility assessments, Beta = .330, t = 2.41, p = .018.

Next, we examined the relationship between users visual attention and browsing behaviors and assessments of credibility of the news organization. A multiple regression analysis showed that the user behavior elements did not significantly predict overall credibility of the news organization, F(8, 76) = 0.92, p = .223, R2 = .089. Within the model, however, **visual attention to best practices elements** was

a significant predictor of organizational credibility, Beta = .208, t = 2.67, p = .040.

Finally, we wanted to test the relationship between news consumers' visual attention and browsing behaviors and perceived value to the audience of the news organization. A multiple regression analysis showed that the model with only attention to journalism transparency elements was significantly associated with perceived value to the audience, $F_{(3, 84)}$ = 3.04, p = .034, R^2 = .101. Specifically, visual attention to best practices elements was shown to predict perceived value to the audience, Beta = .316, t = 2.53, p = .013. The addition of page browsing behaviors increased the predictive value of the model, $F_{(8, 76)}$ = 1.89, p = .072, R^2 = .101, R^2 change = .065, although the expanded model fell just short of the standards for statistical significance. The model showed that in addition to visual attention to best practices elements on the article page, Beta = .345, t = 2.67, p = .009, viewing of policy and standards pages also predicted perceived value to the audience, Beta = .354, t = 2.15, p = .035.

How Individual Differences Affect User Behavior

We also wanted to analyze the extent to which individual differences between users in education and media perceptions influenced which sections participants browsed during their 3-minute credibility assessment interval. To examine these questions, bivariate Pearson correlations were run between five of our pre-exposure measures (age, education, political ideology, procedural news knowledge, generalized news trust, and perceived news bias) and viewing time, in milliseconds for each category of website pages (Articles, Homepage, Journalistic Expertise, and Policies & Practices, and Section Pages).

The results showed that participant age, (r = -.275, p <.01), and education level, (r = -.299, p <.01) were significant negative predictors of participants' time spent viewing the homepage during their credibility assessment browsing. Procedural news knowledge, on the other hand, was a negative predictor of time spent viewing articles during credibility assessment browsing, r = -.240, p <.01. Lastly, perceived news bias was a significant predictor of time spent on journalist expertise pages r = .173, p <.01. No individual differences predicted browse time for Policies and Procedures pages or Section pages.

Credibility Assessment in Users' Own Words

Finally, we asked study participants about which aspects of the web site influenced their credibility assessment. Participants' responses to two open-ended questions were examined and analyzed for thematic patterns and commonalities in their responses.

Four common themes that emerged most frequently were:

1) discussions of the news organization's funding, revenue model, or practices related to display advertising on the page ,

2) sourcing of facts and quoting of individuals within the news articles,

3) the journalists' credentials, and

4) the ability to locate policies or standards.

A number of participants mentioned information about the financial models of the news organizations, and how those models affect the user experience, as a factor in their evaluations. The presence of a paywall on some of the sites (the researchers provided log-in information) served as both a credibility cue ("[Publication] sounds like a legitimate news source, they're behind a paywall") and as a source of frustration ("Paywall is always upsetting. It makes the primary focus of the site seem to be about making a profit."). A number of participants noticed that some of the organizations identified as non-profits, which was usually mentioned in a positive light (e.g., "The non-profit status and balanced storytelling. Up front about why we could trust their reporting"). Participants also took note of the presence of advertising, which seemed to serve as a positive and negative credibility heuristic depending on the implementation (e.g., "The ads run on the site for other articles were similar because they were not very biased and seemed important;" "Had a spam of click bait articles advertised at the bottom which you find on news aggregate sites like msn news and such, makes the site seem like it just wants news for clicks and less credible...it seems like a not very reputable news source but one which really wants clicks for money."

Some participants clearly took the time to look for more information about the author of the article they read. One participant noted, "The author of the article has a history of writing articles for other big corporations like NBC and one of his credits was for "writing or covering quirky news stories" which does not lend a lot of credibility." Other participants may have found more reassuring information, but had to assess perceptions of the journalist within the context of their employer. One participant described this negotiation such: "While the journalist that wrote the article looked to be well-respected and experienced in her field, something about the website coming from TV news makes me feel unsure about what I'm reading." Other participants tried to ascertain potential biases and weigh them against the reporting practices they noticed in the article itself, with one noting "There was a clear slant in the article and the website toward more liberal ideologies, but as a whole it seemed to report perspectives from both sides. Additionally, the source was upfront about their information and sources," and a second participant noted "I felt that the reporter went out of his way to contact multiple sources/leads - he didn't get much of the perspective of the landlords, but he tried!"

A number of participants made explicit mention of policies, indicators, and other aspects of journalistic transparency on the site, and these were always mentioned in a positive light. At the most basic level, participant gave credit to sites for making some of this information easy to find, as did one participant who noted "The site provides information about how long it has been around, who is involved, and its sources." This extended to information about the journalists themselves; "I appreciated the paragraphs under the article discussing the journalist's background and qualifications, as well as their chosen subjects to investigate and report on."

In some cases, the presence of journalistic transparency content seemed to serve as

counterbalance to concerns about the trustworthiness of for-profit news. One detailed reply exemplified this balance: "I noticed that the *Denver Post* is verified by the Trust Project. The site included a detailed editorial policy explaining their fact-checking process, use of quotes, byline policy, etc. I felt that the story itself was less detailed…I felt that the ratio of quotes was mostly balanced to reflect the parties involved. The [Publication Name's] financial situation was less transparent--, my understanding is that [it] is a for-profit, possibly syndicated newspaper, which may influence the source's credibility and trustworthiness." This passage and those from other consumers point to the multifaceted role of news credibility assessment, with users basing their assessment on a weighting of both bottom-up cues from within articles and larger organizational practices.

IMPLICATIONS

This study sought to add depth to our understanding of how users form credibility assessments of online news websites by combining several measurements of user behavior, namely visual attention to journalistic transparency elements on article pages and page browsing across news websites, and to user assessments of credibility of the information within the articles.

The findings from the behavioral data, in conjunction with participants' open-ended self-reports of how they used website information to form impressions of the article, news organization, and its readers, depict contemporary online news credibility evaluation as multifaceted process of browsing and weighing numerous information factors.

Journalistic Transparency Elements Can Increase Credibility…

 A key contribution of the present study is empirical evidence linking visual attention to certain journalistic transparency elements and users' evaluations of article credibility and perceived value of the news website to its audience. While some recent experiments have shown that transparency elements are often missed by audiences,[13, 14] this study shows that when they are seen, they can have an impact.

Specifically, users' viewing of information on the article pages that provided information about best practices such as journalistic standards, funding information, or an explanation of reporting practices, and users' viewing of site pages related to policies and practices about funding, staffing, reporting, led to a positive effect on credibility.

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13 (Masullo et al, 2021)

14 (Peifer & Meisinger, 2021)

...But Only When They Are Seen

While these findings may be promising for proponents of journalistic transparency, there are two factors that should be taken in consideration when considering the impact of these findings. First, the duration of time that participants spent viewing these best practice elements on article averaged roughly 4 seconds, a small portion of their total article viewing time, which averaged 8 minutes and 3 seconds across the six articles. Viewers spent an average of an additional 29 seconds viewing policies and standards pages in their post-article browing time.

More importantly though, visual attention and credibility assessments are both measured variables, and even though they are separated temporally, we can not assure that they are causally related. It's possible that some outside factors cause certain readers to both spend more time viewing journalistic transparency elements and rate news sites as more credible.

These findings should provide a ray of confidence for practitioners of journalism and news design that journalistic transparency elements may be worth pursuing if they do not require an overwhelming amount of effort, even if audience members don't view them for long. However given the correlation between time spent on these elements and credibility and value judgments, it's also worth considering how to design them to make them more noticeable and more accessible within the site. There was substantial variance in attention to specific elements within a site, and across sites, which can reflect either differences in how the rest of the page is designed, or how the journalistic transparency elements are designed.

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