

## Trust Online: Young Adults' Evaluation of Web Content<sup>°</sup>

ESZTER HARGITTAI  
LINDSAY FULLERTON  
ERICKA MENCHEN-TREVINO  
KRISTIN YATES THOMAS<sup>1</sup>  
Northwestern University

Little of the work on online credibility assessment has considered how the information-seeking process figures into the final evaluation of content people encounter. Using unique data about how a diverse group of young adults looks for and evaluates Web content, our paper makes contributions to existing literature by highlighting factors beyond site features in how users assess credibility. We find that the process by which users arrive at a site is an important component of how they judge the final destination. In particular, search context, branding and routines, and a reliance on those in one's networks play important roles in online information-seeking and evaluation. We also discuss that users differ considerably in their skills when it comes to judging online content credibility.

Keywords: Credibility, Internet, Users, Web, Branding, Trust, Search, Information-Seeking, Media Literacy

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Eszter Hargittai: eszter@northwestern.edu  
Lindsay Fullerton: l-fullerton@northwestern.edu  
Ericka Menchen-Trevino: emt@u.northwestern.edu  
Kristin Yates Thomas: kristin@northwestern.edu  
Date submitted: 2009-09-08

<sup>1</sup> The second, third and fourth authors' name appear in alphabetical order having contributed equally to this project.

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## Introduction

Both lauded for its breadth and critiqued for its sometimes free-for-all ethos, the Internet is a source of unprecedented amounts of information. In a content-rich environment where much material is no longer evaluated by traditional gatekeepers such as editors before it has the potential to reach large audiences, the ability to find trustworthy content online is an essential skill (Hargittai, 2008; Metzger, 2005). However, as Sundar (2008) has suggested, the assessment of credibility in the online environment is much more complicated than in previous media contexts:

While an assessment of [. . .] simple cues was feasible in traditional media, it is next to impossible for an average Internet user to have a well-defined sense of the credibility of various sources and message categories on the Web because of the multiplicity of sources embedded in the numerous layers of online dissemination of content. (p. 74)

While Internet users have access to enormous amounts of material on the Web, not all of it is necessarily reliable. Credibility assessment can act as a filter that sifts out inaccuracies, providing users with the content that they find most believable (Flanagin & Metzger, 2000; Wathen & Burkell, 2002).

What cues do users rely on to decide whether they should trust material being presented to them online? Although this is a question that researchers have explored extensively in the past (for a helpful bibliography on the subject, see Flanagin & Metzger, 2007a), the unique methodology employed in our study allows us to consider this issue in a larger context than previous work made possible, resulting in findings that add important dimensions to how this matter is currently understood. In her review of the literature with recommendations for future research, Metzger stated the following:

A research agenda for the issue of Internet credibility must include studies of information evaluation using a greater variety of research methods, on a greater variety of Internet users, performing a greater variety of search tasks than has been done to date. (2007, p. 2086)

We take this invitation for such research seriously and in the current study draw on a more holistic approach to examining online credibility assessment than is usual in this literature. We use a more varied set of search tasks administered on a more diverse user group than is common in this domain. Additionally, instead of asking respondents to evaluate a hypothetical Web site in an experimental setting (an approach common in this area, e.g., Flanagin & Metzger, 2007b; Freeman & Spyridakis, 2004), our methodology relies on users navigating the open Web. This approach allows us to observe and analyze users' actions from initial steps of the information-seeking process through the entire search process of obtaining a response to a question and evaluating the found content.

Our methodology made it possible for us to uncover a crucial part of the puzzle of online credibility assessment heretofore largely absent in this literature: the important role that search context plays in what content many users deem trustworthy. That is, rather than simply evaluating content based on the features of the destination Web site, users put considerable trust in the online equivalent of

traditional gatekeepers: search engines. Users exhibit a great amount of trust in these tools, independent of whether they lead to the most relevant content (Pan et al., 2007). Search engines have become the most prevalent means for information seeking online (Fallows, 2005), with the potential to garner large influence not only on what content is most accessible to users (Hargittai, 2000), but based on findings from our study, also what material users deem trustworthy.

To support our claim concerning the important role the search process itself and other contextual factors play in how users assess the credibility of online materials, we rely on original data we collected on users' online information-seeking behavior. Before presenting our evidence, we draw on literature from the fields of media literacy, online information seeking and credibility assessment to contextualize our study. Next, we describe what methods we used to study people's evaluation of material on the Web. Then we discuss the major themes that emerged from our 102 observations of and interviews with a diverse group of young adults. Finally, we briefly discuss skill differences among users and suggest avenues for future research.

### **Media Literacy, Information Seeking and Credibility Assessment**

Scholars have long been concerned with whether people approach content they encounter in the media critically, an area referred to as media literacy (e.g., Buckingham 2003; Livingstone, 2004). Generally speaking, research has found, across a wide range of ages in both online and offline contexts, that people have difficulty with these skills. While children are exposed to online media at an increasingly early age, studies have shown that many adolescents do not possess the expertise required to search the Web efficiently or critically assess the credibility of what they find (Bilal, 2001; Eastin et al. 2006; Kafai & Bates, 1997; Kuiper et al., 2005). Older teens in high school face similar challenges. For example, when citing sources for essays about science topics, one study found that participants did not fully comprehend the differences between Wikipedia articles and other sources (Forte & Bruckman, 2008). Similar challenges exist in the world of offline sources. An experiment that dealt with students' attention to and use of multiple print sources such as autobiographies, histories, and novels, found that many high school and college students, even when specifically prompted, did not pay sufficient attention to the sources and context of the documents (Britt & Aglinskias, 2002). The study materials contained information from different sources, but the presentation format was standardized so that content from a book did not look different from other media content. Such lack of contextual cues is precisely what scholars have pointed to as a source of difficulty in determining credibility online (Metzger, 2007). The results of that offline study then may also be relevant to investigations of Web credibility, as we can expect people to show variation in their ability to assess and evaluate online content.

The focus of investigations looking at how people find information online has ranged anywhere from considering the features of the retrieval system to how users approach the search process (for a review of this literature see Markey, 2007). While research on information seeking is mainly concerned with how people arrive at material of interest, research on credibility assessment takes as its central focus how people evaluate content once they have found it. Here, we are interested in both of these activities, seeing them as two components of the process that leads people to arrive at material on the Web. To clarify, the present study does not seek to assess the credibility of particular Web sites, as some work in

this domain has done in the past. Rather, we focus on user *perceptions* of credibility when evaluating information online.

Research suggests that credibility is analogous to the concept of believability (Tseng & Fogg, 1999; Wathan & Burkell, 2002; Johnson & Kaye, 2002). Various studies have addressed how users form opinions about the credibility of Web sites. Here we review the models that previous work has put forward about this process. One approach to understanding how users assess online credibility is the prominence-interpretation theory (Fogg, 2003). This theory suggests that credibility assessment occurs when users notice elements of the sites they visit (prominence) and then interpret those elements in order to verify the credibility of the information they have found online (Fogg, 2003). Factors that may affect user interpretation according to this theory include user assumptions based on culture and experience, the user's skill level and competency, and the context of both user expectations and environment (Fogg, 2003).

Models developed to explain how users assess online content break down the process into stages (Fritch & Cromwell, 2001; Wathen & Burkell, 2002). Wathen and Burkell (2002) propose a model that splits credibility perception into two categories: evaluation of surface credibility and evaluation of message credibility. During the first stage, users evaluate the credibility of online sources based on surface characteristics of interface design, such as fonts, organization, and attention to detail. If users judge that the visual presentation of the Web site meets their personal expectations for what a credible site should look like, they move to the second stage, assessing the credibility of the content of the message, including credentialing the information, assessing accuracy and relevance (Wathan & Burkell, 2002). Both of these stages are concerned with what is on the site. However, this model does not consider how a site is found.

Another, more elaborate model proposed by Fritch & Cromwell (2001) suggests that when users are assessing the credibility of online information, they do so by constantly cycling through four stages of evaluative criteria based on cognitive authority, which is a composite of both information quality and credibility. Using a framework of filtering, this model suggests that users are constantly evaluating messages based on four classes of information: format and presentation, author identity and credentials, institution, and affiliation. Once users classify the information based on these four groups, they move to the second stage of the model and start assessing the information provided. It is the combined assessment of those four classes that leads users to ascribe information as having (or not having) cognitive authority.

While considerable prior research has examined what users claim to do in order to find credible information online (e.g., Fallows 2005; Flanagin & Metzger, 2000; Metzger, Flanagin, & Zwarun, 2003), less common is research that compares actual and reported behavior (e.g., Flanagin & Metzger, 2007b; Freeman & Spyridakis, 2004; Rieh & Hilligoss, 2007). Commenting on this body of work, Metzger stated: "people know they 'should' critically analyze the information they obtain online, yet rarely have the time or energy to do it" (Metzger, 2007, p. 2078). Few studies have looked at what users actually do to assess online credibility. Eysenbach and Kohler (2002) used focus groups, observations and interviews to find out how users assess the credibility of online health information, but the very small sample size and single topic (21 focus group participants, 17 observations and interviews) limit the generalizability of the

findings. Tombros, Ruthven, and Jose (2005) studied which cites 24 participants found useful during three information-seeking tasks and which features of the sites (pictures, textual content, site design) led them to their decision. This study, however, used a convenience sample and the goal of the study was to help designers of recommendation systems rather than to understand credibility assessment.

The above-discussed models all focus on how people evaluate online content once they have arrived on a specific Web site. Such approach to credibility assessment is iterative and multifaceted, involving user judgments on the sites' content, presentation and authorship. However, these models do not include a consideration of the larger context of information seeking, that is, how people arrive at Web sites in the first place and how that process might influence their assessment of the destination site's credibility.

Search engine use is one of the most popular online activities second only to email (Fallows, 2008), which underscores its potential role as a broker to online information (Pan et al. 2007) and warrants its consideration in a study of online credibility assessment. According to a 2008 report from the Pew Internet & American Life Project, a premier authority on tracking Americans' Internet uses, 49% of users turn to a search engine on a typical day (Fallows, 2008), a figure even higher among young users at 55%. Related to credibility assessment, an earlier report from the same organization (Fallows, 2005) found that 68% of American Internet users surveyed believe that using search engines provides them with "a fair and unbiased source of information," and that percentage jumps to 72% for those under the age of 30 (Fallows, 2005). This study also found that only 38% of Internet users were aware of the difference between paid and sponsored links on a search engine results page. Within that same group, only 47% responded that they could always distinguish between paid and unpaid search engine results. These findings suggest that while users may feel confident in their ability to find accurate and credible information online, that confidence may not translate into actual skills in credibility assessment. Consequently, it seems important to consider search engines as part of the model for credibility assessment.

Despite the tremendous amounts of information available on the Web, research has shown that users continue to rely on people in their networks when seeking various types of information. Such work has examined different domains of information search from recreational activities (Kayahara & Wellman, 2007) to cultural content (Tepper, Hargittai, & Touve, 2007) and has found that users supplement online sources with advice they get from friends and family. This underscores the importance of seeing information technology uses in the larger context of people's everyday lives where online and offline activities are constantly intertwined (Wellman & Haythornthwaite, 2002).

Finally, it is important to recognize that people may differ in their individual approaches to credibility assessment. Research on young Internet users has found that online abilities vary considerably even among highly wired populations (Hargittai, 2010; Hargittai & Hinnant, 2008; Livingston & Helsper, 2007) and concern, among other things, the understanding of how search engines work (Howard & Massanari, 2007). Although not a central focus of this paper, we remain cognizant of how such differences may influence our observations.

## Data and Methods

We draw on some quantitative, but primarily qualitative data to answer the questions raised above. Young adults represent the most wired segment of American society (Fox, 2004; Madden, 2006; National Telecommunications and Information Administration, 2004) warranting a focus on their Internet uses in particular since disparities in access are lower than other population groups. Below, first we explain how we collected our data and then describe baseline information about the sample. Next, we explain how we assessed users' evaluations of online content credibility using a survey, but mainly draw on in-person observations and interviews with respondents.

### *Data Collection*

We conducted our study among first-year students at an urban public research university in the Winter and Spring of 2007.<sup>2</sup> Thanks to the composition of the school's student body — ranked as top-10 in ethnic and racial diversity by *U.S. News and World Report* (2006) — doing our research there allowed us to reach a diverse group. Working with the First-Year Writing Program at the University of Illinois, Chicago, we were able to reach a representative sample of students at the school since the program sponsors the only required course on campus thereby allowing us to sidestep any selection bias concerning participants. Of the 87 sections offered as part of this course, 85 took part in the study yielding a 98% participation rate on the part of course sections. The final response rate of 82% is based on all of the students enrolled in the course. In order to control for time in the program, our study sample comprises the 1,060 first-year students in the Program.

We started by administering a paper/pencil survey in the First-Year Writing Program classes. We used this method to avoid biasing against people who feel less comfortable filling out Web forms or who spend less time online and thus may have less of an opportunity to participate. The average survey completion time was approximately 30 minutes. The survey included detailed questions about respondents' Internet uses (e.g., experience, context of use, types of sites visited, and online activities) and their demographic background.

For the in-person observations and interviews we relied on a stratified random sample drawn from the 1,060 first-year students who had been surveyed and had agreed to participate in a follow-up study. We wanted to ensure equal representation of both men and women. We also stratified the sample on skill given that prior work had suggested that user competency may influence interpretation of online materials (Fogg, 2003). In order to ensure equal representation of students by high, medium, and low-level online abilities, we relied on their responses to survey questions about Internet know-how. Respondents were asked their level of understanding of 27 Internet-related terms and we created a summary variable of these responses. This measure is based on established work studying Web-use skills (e.g., Hargittai, 2009; Wasserman & Richmond-Abbott, 2005). We successfully ended up with a follow-up

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<sup>2</sup> The authors of this article are not located at this university. Focus on this campus is the result of careful consideration about what type of student population would be most helpful in addressing questions of interest in the overall research project.

sample diverse on this measure. Students were offered \$40 as compensation for their participation in the observational session. Of the 192 students contacted for this portion of the project, 102 responded yielding a 53% response rate.

#### *Sample Descriptives*

Both the survey and the follow-up group represent a diverse set of students. Here, we focus mainly on describing the follow-up observational group that represents the participants whose online information seeking and credibility assessment we analyze in this paper, but all tables include information for both samples. We only contacted 18- and 19-year-olds for the follow-up study in order to concentrate on the youngest people in the overall sample.

As Table 1 reports, our sample is quite diverse on all accounts. We have close-to-equal representation of men and women. Less than half of the follow-up group is White with large portions of Hispanic and Asian/Asian American students in the group. Students come from varied family backgrounds regarding parental education (our proxy for socioeconomic status). In the domain of academic interests we also see diversity with numerous academic concentrations represented.

*Table 1. Descriptive statistics about study participants, all survey respondents and the follow-up observational group (percentages).*

	Survey respondents (n=1,060)	Observation & interview participants (n=102)
Women	55.8	49.0
Age		
18	64.8	70.0
19	32.2	30.0
20-29	3.0	0
Race and Ethnicity		
White, non-Hispanic	42.7	43.0
Hispanic	18.8	18.0
African American, non-Hispanic	7.7	4.0
Asian American, non-Hispanic	29.6	34.0
Native American, non-Hispanic	1.2	1.0
Parents' Highest Level of Education		
Less than high school	7.4	6.9
High school	19.0	19.6
Some college	20.1	23.5
College	34.4	39.2
Graduate degree	19.1	10.8
Major		
Health sciences	23.2	23.0
Science	15.8	15.0
Business	12.6	13.0
Social Science	13.5	10.0
Math/Computer Science/Engineering	12.2	11.0
Nursing	7.4	8.0
Arts/Humanities	6.4	7.0
Architecture/Design	6.0	7.0
Education	4.3	5.0

*Note:* We purposefully restricted the follow-up sample to students who were 18 or 19 as we were especially interested in young adults' Internet uses. Numbers may not add up to 100% for majors as students could indicate more than one major.



Regarding experiences with the Internet, this is truly the wired generation as indicated by the figures in Table 2. On average, students have been online for years and use the Internet regularly. They have several locations of access (an aspect of use that has been shown to matter in how people use the Internet [Hassani, 2006]). Overall, there is no statistically significant difference between participants in the follow-up study and in the overall survey study based on these Internet experience variables. This is also true of the index skill measure, students who took part in the observational study are, on average, similarly skilled compared to the 1,060 students who participated in the larger project. In both the larger group as well as the subsample, there is considerable variance on our digital literacy measure suggesting that we have both very digitally savvy and much less knowledgeable respondents in the study. The representative nature of the follow-up sample is expected since we put great effort into ensuring that our stratified sampling would yield a representative group.

*Table 2. Respondents' Internet use experiences (mean with standard deviation in parentheses).*

	Survey respondents (n=1,060)	Observation & interview participants (n=102)
Number of Internet use years	6.3 (2.0)	6.2 (2.0)
Number of hours on the Web weekly*	15.5 (10.0)	17.0 (10.7)
Number of Internet access locations	6.2 (2.1)	6.1 (2.2)
Number of Internet use locations	3.0 (1.5)	3.0 (1.5)
Home is location of most frequent Internet use	92.9%	94.1%
Skill index	81.3 (22.6)	83.5 (25.3)

*Note:* This measure only concerns Web use and excludes time spent on e-mail, chat, or VoIP.

#### *Measuring Credibility Assessment: Surveys*

On the survey, we mainly relied on earlier studies of credibility assessment regarding students' approaches to online materials (Consumer Reports Webwatch, 2005; Metzger, Flanagin, & Zwarun, 2003). Table 3 presents the items and responses for both the large survey sample as well as the follow-up study sample. The two are very similar, again suggesting that the follow-up sample is representative of the larger group and thus the first-year class at this university. The first related question asked respondents to indicate the importance of various factors in "deciding whether to visit a Web site" on a 5-point scale. Choices ranged from "not at all important" (1) to "extremely important" (5). Of the three factors included on the survey, most important deemed to be "being able to identify easily the sources of information on the site" while "knowing who owns the Web site" and "knowing what business and organizations financially support the site" seemed to be of less importance to students, on average.

The second survey question about credibility assessment asked respondents to indicate the frequency with which they engage in various actions when looking for information for school work. The response options ranged from "never" (1) to "very often" (5). It seems that the least common actions among students are "checking if contact information is provided on the Web site" and "checking the

qualifications or credentials of the author." Respondents reported engaging in the other five factors more, all of them either sometimes or often, on average (see Table 3 for details). We also asked students the frequency with which they visit the "About Us" page on a Web site. They report engaging in this activity rarely or sometimes, on average. Most importantly, again, there is no statistically significant difference on survey measures of credibility between the follow-up observational group and the students represented in the larger sample, suggesting that findings from the smaller group are generalizable to the larger sample.

*Table 3. Participants' responses to questions about credibility assessment (5-point scale ranging from 1-5).*

	Survey respondents (n=1,060)	Observation & interview participants (n=102)
Importance of the following reasons when deciding to visit a Web site (1-5)		
Being able to identify easily the sources of information on the site	3.7 (1.0)	3.8 (1.0)
Knowing who owns the Web site	2.4 (1.1)	2.4 (1.2)
Knowing what business and organizations financially support the site	2.3 (1.1)	2.3 (1.1)
Frequency with which user does the following when looking for information for school work (1-5)		
Check to see if the information is current	3.5 (1.0)	3.5 (0.9)
Seek out other sources to validate the information	3.5 (1.1)	3.5 (1.1)
Consider whether the views represented are facts or opinions	3.4 (1.1)	3.4 (1.0)
Check to see who the author is	3.4 (1.1)	3.3 (1.1)
Check to see what other sites link to the Web site you are viewing	3.3 (1.1)	3.3 (1.0)
Check the qualifications or credentials of the author	2.8 (1.2)	2.8 (1.2)
Check if contact information is provided on the Web site	2.7 (1.2)	2.7 (1.0)
Frequency with which user visits the "About Us" page on a Web site (1-5)	2.4 (1.0)	2.4 (1.0)

*Measuring Credibility Assessment: Observations and Interviews*

While survey data are helpful in allowing us to identify overall patterns and quantifying aspects of users' online abilities and perceptions, more nuanced qualitative data can offer valuable additional information when trying to glean an accurate picture of how young adults evaluate online materials. The qualitative data come from respondents' commentary during the time they were looking for various types of information on the Web in response to a dozen tasks presented to them in the follow-up observational sessions (see Appendix I for the full list of tasks). These tasks ranged from rather simple questions with relatively little consequence (e.g., looking up the map of a historical voyage) to more weighty queries with potentially significant outcomes such as ones concerning health matters (e.g., finding emergency contraception information). Instead of working with a list of trivia questions, we purposefully included queries that students might come across during their everyday browsing so as to make the process approximate online actions they may otherwise take. As to students' understanding of our study goals, we simply told them that we were interested in how they go about finding information online, we did not say anything about a focus on credibility assessment.

Respondents sat at an Internet-connected computer with the researcher right next to them reading the tasks (see introductory comments in Appendix I). There was no time limit imposed on respondents, they could spend as much time as they wanted on each task. There was no preset homepage on the browser so as not to influence initial actions. We also had the browser set up so that there was no search engine field in the navigation toolbar. The researcher cleared the cache of the browser between sessions so everyone could start with a clean slate. There was no filtering software on the network so students could access any Web site. Respondents were encouraged to talk throughout their online activities allowing us to collect information about how they were thinking about their Web navigation (Ericsson & Simon, 1993). On average, students spent 47 minutes working on the tasks.

In many other credibility studies, the methods by which respondents arrive at content are ignored, given that participants are simply asked to evaluate features of a mock Web site without any regard for how they might come across it in the first place. However, in the present study, we analyze the entire process of information seeking, from search engine selection to the evaluation of search results all the way to the final destination Web site. Additionally, by allowing students to utilize any and all Web sites (both because the study design did not impose any particular search process and because there was no filtering software), this study gains a degree of realism often lacking in other studies. Rather than simply viewing simulated Web pages and rating their credibility based on design and content alone, participants in our project were exposed to whatever site on the Web they might encounter during their information-seeking process.

We created audio recordings of each session and then transcribed these conversations. Additionally, we also generated video captures of what happened on the screen as respondents were navigating Web sites (see Hargittai, 2002 for a detailed description of the type of methods we employed here). Audio materials could thus be supplemented with additional visual cues during the coding process. We analyzed respondents' comments about their information-seeking and content-evaluation processes using a coding scheme that we developed by reading the entire corpus of material several times.

The 102 in-person sessions lasted a total of just over 80 hours. The interviews yielded 770 pages of transcribed text. We analyzed these data using the Qualrus qualitative data analysis program. We created a coding scheme to categorize various comments that have to do with how students evaluated the material they encountered on Web sites. We started with a coding scheme of 35 codes designed to investigate general mentions of brands, site design elements, information verification talk, offline resources and general credibility talk based on what the existing literature suggests would be salient aspects of the process (Metzger, 2007). After the first round of coding, it became clear that we needed to refine the first set of codes for a better understanding of the emerging patterns of information seeking and credibility assessment. In the end, we went through five further iterations of coding.

The resulting coding categories allowed us to identify several major themes regarding students' online credibility assessment. We draw on these below to discuss what seem to be the main factors influencing how students evaluate online information. Overall, three main themes emerged as significant: 1) the information-seeking process, 2) brands, and 3) contacting people. Each of these was, on occasion, entangled with either positive or negative emotions and value judgments as users considered them. Below we discuss each of the three themes in detail and offer examples to illustrate how they influence users' evaluation of online content.

## **Results**

### *Trust in Search Engines*

A clear theme that emerged from our observational and interview sessions is that the process of information-seeking is often as important as verifying the results when it comes to assessing the credibility of online content. Previous research has shown that users display considerable trust in certain search engines such as Google (Pan et al., 2007) although such work has largely been based on experimental methods and does not go so far as to consider users' credibility assessment of results explicitly. We find evidence of users' trust in search engines with respect to the credibility of information they find when using these services. To complete many of the assigned tasks, students often turned to a particular search engine as their first step. When using a search engine, many students clicked on the first search result. Over a quarter of respondents mentioned that they chose a Web site because the search engine had returned that site as the first result suggesting considerable trust in these services. In some cases, the respondent regarded the search engine as the relevant entity for which to evaluate trustworthiness, rather than the Web site that contained the information. The following exchange between the researcher and a female social science major illustrates this point well:

Researcher:      What is this Web site?

Respondent:     Oh, I don't know. The first thing that came up.

Another indicator of the levels of trust participants had in search engine results may be evidenced by the fact that students often did not investigate those results with regard to who authored the information they found through searching and ended up using to complete the tasks at hand. Overall, just

10% of participants made remarks about either a site's author or that author's credentials while completing tasks. However, examining the screen captures of the tasks being performed makes it clear that even among those participants, none actually followed through by verifying either the identification or the qualifications of the authors whose sites gave them the information they deemed to be providing the best solution for the tasks at hand. This was the case even when participants were viewing a site while stating directly that they ought to check to see who the author of the site is or what the person's qualifications might be. These findings suggest that students' level of faith in their search engine of choice is so high that they do not feel the need to verify for themselves who authored the pages they view or what their qualifications might be.

During their assigned tasks, a few participants used direct emotional descriptors to explain their choice of search engine. When asked to perform a task, a male student undecided about his major noted his admiration for the site as such: "I love Google." In an analogous way, a male social science major noted, "[Google is] the best search engine." Echoing similar sentiments, students also referred to their frequent dependence on search engines. Said a female nursing major, "I depend a lot on Google." Those who favored Google also often noted that the search engine was popular for others as well. Another female nursing major stated in response to a question, "I'd go on Google, that's where everyone goes." Some participants noted that they went to Google for everything. Consider the following comment by a male math/engineering student, "I basically do everything on Google." Accordingly, this student's dedication to Google is mirrored in his response to the survey question asking whether students use different search engines on a daily basis. He stated that he did not.

It was less common for participants to provide positive descriptions about Yahoo! although some of our participants relied on it consistently throughout their online pursuits. A male health-science major, when asked where he found information about current events replied, "Yahoo! The feature page kinda catches my eye [...] 'cause it's different, like the most interesting headlines." Students did not praise Yahoo! as frequently as Google, but some of them did mention using Yahoo! regularly during their daily online routines. A female education major claimed the following: "The Web site that I use mostly for trying to find things is Yahoo!." Like Google, Yahoo! inspired two participants to describe it in emotional terms. However, while Google was described as being loved, Yahoo! was merely "liked".

Going to a specific search engine like Google or Yahoo! was regularly the first step in the information-seeking process and students made this clear in the way they referred to the action of using such a service. That is, instead of simply noting that they would go to a search engine, over a third of our participants (36%) used the name of a search engine (most notably Google) as a verb. Several respondents regularly said, "I'll google it" when asked how they would complete a task. Subjects referred to other services as a verb much less frequently, although a few did do for sites such as Yahoo! and MapQuest. A male health-sciences major's first reaction to a question was the following: "I would yahoo it or google it." These expressions point to another important theme that emerged in our interviews: the importance of prior experience and brands in the information-seeking process. We discuss these in more detail below.

*Reliance on the Known: Brands and Routines*

Brands were a ubiquitous element throughout our respondents' information-gathering process, from initial information-seeking to arriving at the answer to the task at hand. In the sample, almost all (98%) of the participants mentioned a name brand at some point during their task completion. The most frequently mentioned brands were Google (85% of respondents mentioned it at one point or another), Yahoo! (51%), SparkNotes (38%), MapQuest (36%), Microsoft (24%), Wikipedia (19%), AOL (11%) and Facebook (6%). Respondents mentioned major search engines like Yahoo! and Google throughout all of the task completions. In contrast, more specialized sites such as SparkNotes were popular for specific tasks (this one in particular for the task that asked about looking up information concerning Shakespeare's *Romeo and Juliet*). These numbers suggest that brands play an integral role in information-seeking activities, that is, name-brand recognition is a key component of credibility perception, for both the initial search process and the resultant pages a user decides to consult for information.

Known brands were essential signifiers of quality for respondents, and seem to serve as an important part of users' daily information-gathering routines. One task asked participants where they look for current-events information. In response, students often expressed the fact that they used their default browser homepage as a primary source for news. Many of these respondents already had their homepage set to Google or Yahoo! ("usually I just read [...] the featured news on Yahoo!") or that of their Internet service provider (often Comcast or AT&T). For this particular task about current events, they also relied on known offline media properties such as CNN ("I usually just go to CNN" or "[i]n general [...] BBC, CNN, news channels such as that") suggesting the continued importance of offline brands in the online media environment (Hargittai, 2007). During their completion of the various tasks, on the whole, participants mentioned offline brands often: 41% mentioned television brands, 20% mentioned newspaper brands and 2% mentioned radio brands.

As evidence of the importance of routines, we found that 77 of students referenced some aspect of what they typically did while searching for information online. They used statements like "I usually," "I always" or "most of the time" to indicate their routine behaviors. We found that mentions of corporate brands dominated students' reported habits, with 63% of all respondents mentioning a corporate brand as part of their routine search behavior. Nineteen percent of participants mentioned the Google brand as part of a routine. A female math/engineering student claimed: "I basically do everything on Google." A female education major stated: "I would usually go to SparkNotes . . ." while a male architecture/design major noted: "I usually go to [...] Wikipedia." Just five students mentioned an educational brand as part of routine Web use, and two of those cases referred to the students' use of their own institution's site as a home page.

In addition to utilizing brands in their daily routines, respondents also turned to specific brands depending on the task. For example, a task like finding directions seemed tailor-made for well-known corporate brands such as MapQuest or the Chicago Transit Authority. Underscoring students' familiarity with these sites is the fact that rather than searching for them, some participants typed the site addresses directly into the browser's location bar.

For several tasks, category-defining sites began to appear. Subjects went to Wikipedia, a publicly editable encyclopedia, to search for answers.<sup>3</sup> Interestingly, only about one third of the students in our sample (35%) visited Wikipedia during their task completion despite reports by others suggesting higher rates of usage among college students (46% as reported by Rainie & Tancer, 2007). For the Darwin map-finding task, several participants relied on Wikipedia as a source but expressed varying levels of confidence in the site. A male health-sciences major who had been enthusiastic about Yahoo! earlier voiced confidence in Wikipedia during his response to one of the tasks: "Here's Wikipedia. Here's all the information. It's pretty much credible." However, other subjects expressed doubt that Wikipedia was truly a credible source. A female nursing student, completing the same task as the male quoted above stated, "Wikipedia's [...] not [...] something you should [...] rely on [...] the whole time. Anybody could [...] write stuff about [...] anyone on Wikipedia. You should [...] go further on, to [...] see what else is out there." Another student, while searching for directions to a health clinic, more succinctly summed up her feelings by stating simply, "I hate [Wikipedia]" although she was not asked to elaborate so we do not know the reasons for this sentiment.

SparkNotes, a popular site with study guides and summaries for classic literature texts, appeared exclusively when subjects were asked to find a passage from Shakespeare's *Romeo and Juliet*. Many students went directly to the SparkNotes site by typing it into the browser, rather than finding the SparkNotes page through a search engine. For the medical tasks, where participants needed to find information about HIV clinics and emergency contraception, WebMD and Planned Parenthood emerged as the two most utilized and respected sites. A male science major expressed trust in the WebMD brand, "[i]f [...] WebMD came up or something [...] I would trust this source." When asked to find emergency contraception, subjects also frequently mentioned offline brand-name pharmacies, such as CVS and Walgreens.

For certain tasks, Microsoft emerged as a credible brand. To find a map of Darwin's voyage, participants expressed unilateral trust in Encarta, a Microsoft-branded encyclopedia. A male social-science major expressed confidence in the site by noting the following: "Here's MSN Encarta, I know it's a pretty good encyclopedia." Similar sentiment about the brand was echoed by a female health-sciences major: "It's on Encarta, it looks like it's pretty reliable." For another task, participants were asked to figure out elements essential for a resume. In this case, several turned to the pre-made resume templates in Microsoft Word.

However, not all name brands were trusted equally. Web sites from educational organizations and government entities were often trusted more than the average commercial site. Some participants expressed the opinion that sites from educational entities (schools and colleges) were more credible than other sources. The implication of a dot-edu or dot-gov site for some students was that these sites were not written by just anybody, and contained higher-quality information than commercial sites. In sum, 8% of the sample made such a statement during the session. When asked to find a map of Darwin's voyage,

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<sup>3</sup> In a separate paper that includes additional analyses of this same data set, we focus attention on analyzing students' approaches to Wikipedia in particular (Menchen-Trevino & Hargittai, In Press). In our discussion of findings here, we allot it attention relative to its occurrence in our data.

a female nursing student found a site from a university and justified her selection as such: "I trust it because it's an edu." A female science major said she would trust getting credible resume information from a particular site she was viewing, because "it's dot-edu." In order to find credible information, a male math/engineering major stated that he would make sure the site was "from a dot-edu or it's from a professor, because mostly those are good sources."

In terms of credibility, along with dot-edu sites, some students favored looking at search results that were from dot-gov domains. Nine percent of respondents made an explicit reference to such a site. When asked to find the email address of the Chair of the House Judiciary committee, respondents relied heavily on official US government Web sites. However, trust of dot-gov sites was mentioned in other tasks as well. When asked about his daily news gathering routines, a male humanities major suggested the following: "Anything, [...] with a dot-gov I'd probably read more than a dot-com . . . or dot-org, just because it's not commercial."

While no participants stated that they would trust dot-com sites over any other top-level domain, many expressed trust in the top-level domain dot-org. However, that domain is as freely available for registration as dot-com and is not for nonprofit organizations only as might have been its original purpose. Some participants expressed more trust in dot-org sites than in their dot-com counterparts even though, theoretically, this is not justified. A male architecture and design student stated that he was most likely to get resume advice from a site that ended in dot-org. When asked why such a site was credible he replied, "[b]ecause it ends in org." Perhaps not surprisingly, this student had a low skill score from the survey suggesting that his know-how about Internet issues is among the lowest in the group. A female nursing student who expressed trust in dot-edu sites stated that to look for information on emergency contraception: "I would definitely look for Web sites that end with org to be [...] safe."

Overall, the examples presented in this section make clear that many students put a lot of faith in search engines and brands they trust either from their offline lives or thanks to extended experiences with them online. These findings highlight the importance of conducting studies in a more naturalistic setting than is typical of many other studies in this domain so that we can understand all aspects of what influences how people evaluate online materials. The next section points to an additional factor in the information-seeking process often ignored, by design, in traditional studies of credibility assessment when respondents are instructed to focus on the features of specific Web sites: reliance on offline resources.

#### *Contacting People*

As noted in our literature review, some work has found that on occasion users prefer to get in touch with a person in order to find an answer to a question, despite the fact that all of the information necessary to complete each task was available online. Among our sample of 102 participants, overall 60% stated, at one point or another that they would contact an institution such as a university or governmental agency for information. Broken down by method of contact, 52% of the sample suggested placing a phone call, while 17% said they would send an email to the organization. An additional 10% mentioned that they would contact an institution for help without indicating what method they would use to do so. Professionals, both medical and educational, were second on the list of those whom participants



would contact offline with a fifth of our respondents suggesting that they would pursue this method. Thirteen percent of the sample mentioned that they would contact a medical professional to obtain the information they were seeking, while another 8% would contact an educational professional (the type of professional depended on the information sought for the particular tasks). Running a close third were mentions of contacting a friend or family with about a fifth (19%) of the sample suggesting this method of obtaining information: 17% of participants mentioned contacting a friend and 8% talked about contacting a family member.

### **Skill Differences**

As we noted earlier, when it comes to credibility assessment, it is important to recognize that differences may exist among users. Although our data here do not allow us to engage in a systematic investigation of skill differences among users, we have enough evidence of varied abilities to warrant a brief discussion of the fact that students differ in their aptitude when it comes to evaluating online content credibility. As noted earlier, we used a stratified random sample to recruit respondents representing different skill levels to our follow-up study given that prior work had noted the importance of skill in the credibility-assessment process (Fogg, 2003; Metzger, 2007). Skill differences observed on survey measures are reflected in differentiated approaches to evaluating online content as noted in some examples described earlier. Here we present some additional cases of varied approaches to highlight this point.

We have already discussed in detail many respondents' trust in particular search engines. Students differ in the extent to which they understand the reasons behind search engine rankings. A female health-sciences major described her search routine as follows: "I usually click on the first thing that I see." Asked to clarify how she decides to pick the first result, she emphasized, "Well, I know the ones that are [...] in here [pointing to the shaded Sponsored Link section on a Google results page] they're the most relevant to what I'm looking for." Interestingly, in this case she was pointing to a highlighted link labeled as a Sponsored Link by Google. While sponsored links may well be applicable to a search question, their placement on top of the results page is at least in part determined by financial incentives rather than solely relevance, a point the respondent did not raise at all, presumably because she was unaware of it.

A male humanities major expressed a similar understanding of the site by stating the following: "From my [experience] using Google [...] the most visited Web site is at the top so it's probably going to be the most relevant Web site and I think that's true." Similarly, recall the female social science major cited above (in the first paragraph of the section called "Trust in search engines") who did not look at features of her destination Web page to assess its credibility, rather, was satisfied by the fact that it was the first result. Looking at her skill score from the survey shows that she ranks among the bottom 10% of respondents suggesting that search engine rankings are not the only aspect of the Web that she does not understand.

Web addresses are another source of varied know-how among students. The most obvious example of confusion over top-level domain names came from the female science major who suggested

that she would look for information about current events at yahoo.gov, a non-existent Web site. Her skill score places her in the lower half of women in the sample regarding Internet savvy, suggestive of the fact that URLs are not the only Web-related item whose understanding she may lack.

Another example of differentiated skill level concerns people's tendency to verify information they found on one Web site by going to another. Among our participants, 48%, at one point or another during their session, verified the information they found on one site by consulting another with similar information. Some students said they usually verified information between multiple Web sites. A male science major stated it explicitly as follows: "usually [...] I would look at a lot of sites and if they all had the same amount, the same type of things [...] this is basically how I do stuff."

When asked if Microsoft was a credible source for resume advice, a female health-sciences major noted the superiority of the established Microsoft name over the various unknown sites that appeared in Google's search results. She said, "I would be happy with [...] Microsoft Word, [...] it's more professional, and so I would feel that it would have [...] more help than if I just pressed Google, because on Google it [...] may not be as professional." This particular student had previously used Google for task completions but also mentioned, when finding a map of Darwin's voyage, that she would "go to Google and then [...] do Images and check it, to see how accurate it is. And if I didn't get a lot of accurate results, [...] I'd go into Google Scholar."

By verifying her information and realizing the relatively open nature of Google search results, this student demonstrated a heightened level of sophistication. The fact that she mentioned Google Scholar shows an additional level of know-how as less than half of the sample had ever heard of that site and just over 10% reported using it (this information we obtained from everybody on the survey). Indeed, based on this participant's responses to the skill measure on the survey, she is one of the highest-skilled students in our sample ranking fourth among female participants in the follow-up study based on her summary skill score. Although not the focus of the present study, it is important to point out that participants vary considerably in their online skills. As evidenced by the examples described in this section, students' levels of sophistication when it comes to credibility assessment are by far not equal.

### **Future Directions**

While our methodology and resulting data have allowed us to make unique contributions to the literature, many important questions remain for the research enterprise concerned with understanding how people assess the credibility of online content. First, as others have noted (Metzger, 2007), it is important to recognize that motivation associated with a task will influence the extent to which a user will be inclined to expend energies on verifying the credibility of material on a Web site. While information-seeking tasks that lack serious implications (e.g., looking up the most recent sightings of a celebrity) may not lead users to consider a site carefully, queries with significant real-life consequences (e.g., treatment of a health condition) may motivate people to approach the search process with much more care. The extent to which people are able to pursue more information in the latter case will, however, depend on user skills as suggested by the material discussed in the previous section as well as prior literature (Fogg, 2003; Metzger, 2007). Therefore that aspect of user characteristics should be a conscious part of

research on credibility assessment.

Second, this domain of inquiry continues to lack in valid survey measures of credibility assessment. One of our survey questions asked students to indicate the frequency with which they “seek out other sources to validate the information.” We compared survey responses to students’ actual tendency to verify information across sources based on what they did in our study sessions. We found no relationship between the responses to the credibility assessment questions on the survey and people’s actual behavior. Others (Flanagin & Metzger, 2007b) have also found similar discrepancies between actual versus reported performance. Consequently, much work remains in developing instruments that yield more valid measures that will allow us to gather data on larger and more generalizable samples. Finally, also related to the development of new instruments, it will be important to compare how people do on tasks with how they perceive their ability to find credible information.

### **Conclusion**

By bringing together methods from the information-seeking literature with questions most present in credibility assessment research, this project has considered what factors influence users’ evaluation of online content in a more holistic manner than is usual in existing scholarly investigations. Based on unique data about the online actions of 102 diverse young adults, we have shown the importance of looking at the whole process of information seeking and content evaluation from the first decision about which search engine or Web site to consult initially to the final stage of settling on a page with the sought-after content. Our findings suggest that students rely greatly on search engine brands to guide them to what they then perceive as credible material simply due to the fact that the destination page rose to the top of the results listings of their preferred search engine. Users also rely on brands in other contexts, from going directly to the Web sites of offline brands with an online presence to online-only brands with which they have prior experience.

Much research that looks at how users assess the credibility of online content either relies on self reports about evaluative behavior or actions in the context of mock Web sites. To gain a better understanding of the process, in this study we conducted observations of user behavior in a setting that did not impose barriers on what Web sites participants could consult in their quest for information. Our findings suggest that utilizing this more naturalistic method allows us to uncover user practices that have been hard to capture using earlier methods. People do not necessarily do what they report on surveys (a finding also observed by Flanagin & Metzger, 2007b). Moreover, how users get to a Web site is often as much a part of their evaluation of the destination site as any particular features of the pages they visit. Accordingly, looking at Web site credibility without the entire search context ignores an important part of the puzzle.

Previous work has pointed out the importance of both trustworthiness and expertise, but has neglected to link these to branding (e.g., Wathen & Burkell, 2002). One reason for this may be that brand perception is much harder to influence than site features, such as layout or content, when building a new Web site. Nonetheless, the importance of this factor in assessing a site’s credibility cannot be ignored. Additionally, because the brand effect translates to trust in search engines as well as specific destination

Web sites, perhaps new site creators need to focus their energies on achieving good rankings on search results lists in addition to being mindful about their sites' particular features.

Another implication of our findings is that any intervention hoping to educate people about the assessment of online content credibility (e.g., Harris, 2008; Meola 2004) must start by recognizing the level of trust that certain search engines and brand names garner from some users and address this in a way that is fruitful to a critical overall evaluation of online materials. Although some earlier media literacy interventions have shown promise (Britt & Aglinskas, 2002; Hobbs & Frost, 2003), such training is not commonplace in U.S. schools. A U.S. national assessment of relevant skills — such as using historical evidence to support a position — showed that only 10% of 12th graders were at or above proficiency level (Beatty et al., 1996). Both training and assessment programs are likely in need of updates given the changing media environment. While some have made overarching assumptions about young people's universal savvy with digital media due to their lifelong exposure to them (e.g., Prensky, 2001; Tapscott, 1998), as our study suggests, empirical evidence does not necessarily support this position (see also Bennett, Maton, & Kervin, 2008). As our findings show, students are not always turning to the most relevant cues to determine the credibility of online content. Accordingly, initiatives that help educate people in this domain — whether in formal or informal settings — could play an important role in achieving an informed Internet citizenry.

Appendix I. Task list administered during in-person observation sessions.

*Comments in brackets were instructions for the Researcher only. "R" refers to "respondent."*

*Introductory comments by Researcher at the beginning of each session:*

If you can recall, please bring up the page that is usually on your screen when you start using the Web. That is, the Web site that comes up when you start your Web browser program. [Wait for R to bring up homepage.]

I will now ask you how you would perform various tasks online. Please show me how you would approach these situations. Please note that there is no right way of doing these tasks. We are interested in seeing how you go about finding the following information online.

1. Where do you look for information about current events?
2. Here is a hypothetical. You have a strong opinion about an issue and a friend recommends that you write an email to the chair of the House Judiciary Committee expressing your concerns. Where do you send the message to reach this person?
3. You need to read Act 2 Scene 4 from Shakespeare's Romeo and Juliet by tomorrow for class. What is a quick way you can get access to it?
4. You are at home in the middle of summer. A friend calls you frantically on Friday at midnight. The condom broke while she was with her boyfriend. What can she do to prevent pregnancy? Remember, neither of you is on campus. She lives in South Bend, Indiana.
5. (A) A friend of yours is graduating from high school. He has a 2.5 GPA and scored 24 on the ACT. What are the chances that he will get into the University of Illinois at Urbana-Champaign?  
[Wait until R finishes task]  
(B) . . . and how about Columbia College here in the city [Chicago]?
6. (A) Your cousin is concerned about her health and wants to get an HIV test. She is not a student at any school, but lives here in Chicago. Can you help her find a place to get such a test? Where is the location of such a place and at what times are they open for this service?  
[Wait for R to find a place]  
(B) Let's say you want to go with her. How do you get to this place from UIC [University of Illinois, Chicago]? [Wait for R to approach the question and see if R figures out a method. Then follow up with the next question if R was not using public transportation in that case.] Can you get there using public transportation? How?
7. You have to create a poster presentation for class. You're most concerned about how such a document should look and how it can be created with minimal effort on your part concerning the layout. Find help online with your poster layout so that you're ready to go with your own project.

8. Does Microsoft Word store information about the author of a document? [Wait for response.] It turns out it does. How can you change the settings in the program so this information is not readily available when the document is shared? [Have R do it.]
- Is it possible to do this so no future documents have the identifying information? That is, change things so that you don't have to do this on every new document you start? [Wait for R to respond.] It is possible.
- Please find out how this can be done. [Don't have R actually do this, just have R find out information about how to do it.]
9. You are helping your nephew with his homework. He needs a map of Charles Darwin's voyage around the globe, the entire voyage. Help him get such a map.
10. You need to address a letter to the following person and do not know whether this is a man or a woman. The person's first name is Harshini. Can you figure out whether this is likely a man or a woman?
11. You are trying to figure out how to write a resume for a summer internship. Find an authoritative source on the subject that helps you identify four key things that need to be on the front page of your resume.
- 12.<sup>4</sup> (A) I heard that in Victorian times, people could carry a special kind of notebook around with them and use it to copy quotations they read and clever sayings they heard. There was a specific name for that kind of notebook, but I've forgotten what it is. Can you tell me?
- (B) You are trying to figure out what two businesses are next door to Brandy Ho's Chinese restaurant in the North Beach neighborhood of San Francisco. What are they?

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<sup>4</sup> Half of the sample was asked A, the other half was asked B. A new task was introduced since nobody in the first half of the study could figure out the correct answer to A and we were striving for some variance in responses. We thank Daniel M. Russell for suggesting these two questions.

### References

- Beatty, A. S., Reese, C. M., Persky, H. R., & Carr, P. (1996). NAEP 1994 U.S. History Report Card. Findings from the National Assessment of Educational Progress. Washington D.C.
- Bennett, S., Maton, K., & Kervin, L. (2008). The "digital natives" debate: a critical review of evidence. *British Journal of Educational Technology*, 39: 775–786.
- Bilal, D. (2001). Children's use of the Yahoo!igans! Search engine II. Cognitive and physical behaviors on research tasks. *Journal of the American Society for Information Science and Technology*, 52(2), 118–136.
- Britt, M. A., & Aglinskias, C. (2002). Improving students' ability to identify and use source information. *Cognition and Instruction*, 20(4), 485–522.
- Buckingham, D. (2003). Media education: Literacy, learning, and contemporary culture. London, Polity Press.
- Consumer Reports Webwatch. (2005). Leap of faith: Using the Internet despite the dangers.
- Eastin, M. S., Yang, M.-S., & Nathanson, A. I. (2006). Children of the net: An empirical exploration into the evaluation of Internet content. *Journal of Broadcasting and Electronic Media*, 50, 211–230.
- Ericsson, K. A., & Simon, H. A. (1993). Protocol analysis: Verbal reports as data. Cambridge, Mass: The MIT Press.
- Eysenbach, G., & Kohler, C. (2002). How do consumers search for and appraise health information on the world wide web? Qualitative study using focus groups, usability tests, and in-depth interviews. *BMJ*, 324(7337), 573–577.
- Fallows, D. (2005). Search engine users: Internet searchers are confident, satisfied and trusting—but they are also unaware and naïve. Washington, DC: Pew Internet & American Life Project.
- Fallows, D. (2008). Search Engine Use. Washington, D.C.: Pew Internet & American Life Project.
- Flanagin, A. J., & Metzger, M. J. (2000). Perceptions of Internet information credibility. *Journalism & Mass Communication Quarterly*, 77(3), 515–540.
- Flanagin, A. J., & Metzger, M. J. (2007a). Bibliography on Web/Internet Credibility. Retrieved from <http://www.credibility.ucsb.edu/files/bibliography.pdf>
- Flanagin, A. J., & Metzger, M. J. (2007b). The role of site features, user attributes, and information

- verification behaviors on the perceived credibility of web-based information. *New Media & Society*, 9(2), 319–342.
- Fogg, B. J. (2003). Prominence-interpretation theory: Explaining how people assess credibility online. Paper presented at the CHI '03 extended abstracts on human factors in computing systems, Ft. Lauderdale, Florida, USA.
- Forte, A., & Bruckman, A. (2008). Information literacy in the age of Wikipedia. In Symposium on learning and research in the Web 2.0 era: Opportunities for research. Proceedings of International Conference of the Learning Sciences, Utrecht, Netherlands, 237–244.
- Fox, S. (2004). Older Americans and the Internet. Washington, D.C.: Pew Internet and American Life Project.
- Freeman, K. S., & Spyridakis, J. H. (2004). An Examination of Factors That Affect the Credibility of Online Health Information. *Technical Communication*, 51(2), 239–263.
- Fritch, J. W., & Cromwell, R. L. (2001). Evaluating Internet resources: Identity, affiliation, and cognitive authority in a networked world. *Journal of the American Society for Information Science and Technology*, 52(6), 499–507.
- Hargittai, E. (2000). Open Portals or Closed Gates? Channeling Content on the World Wide Web. *Poetics*, 27(4), 233–254.
- Hargittai, E. (2002). Beyond logs and surveys: In-depth measures of people's online skills. *Journal of the American Society for Information Science and Technology*, 53(14), 1239–1244.
- Hargittai, E. (2007). Content diversity online: Myth or reality? In *Media Diversity and Localism: Meaning and Metrics*. Edited by Philip Napoli. Mahwah, NJ: Lawrence Erlbaum, 349–362.
- Hargittai, E. (2008). The role of expertise in navigating links of influence. In *The Hyperlinked Society*. Edited by Joseph Turow and Lokman Tsui. Ann Arbor, MI: The University of Michigan Press, 85–103.
- Hargittai, E. (2009). An Update on survey measures of Web-oriented digital literacy. *Social Science Computer Review*, 27(1):130–137.
- Hargittai, E. (2010). Digital na(t)ives? Variation in Internet skills and uses among members of the net generation. *Sociological Inquiry*, 80(1)
- Hargittai, E., & Hinnant, A. (2008). Digital inequality: Differences in young adults' use of the Internet. *Communication Research*, 35(5):602–621.
- Harris, F. J. (2007). Challenges to teaching credibility assessment in contemporary schooling. In M. J. Metzger & A. J. Flanagin (Eds.), *Digital Media, Youth, and Credibility* (pp. 155–179). Cambridge, MA: The MIT Press.



- Hassani, S. N. (2006). Locating digital divides at home, work, and everywhere else. *Poetics*, 34(4–5), 250–272.
- Hobbs, R. & Frost, R. (2003). Measuring the acquisition of media-literacy skills. *Reading Research Quarterly*, 38(2), 330–355.
- Howard, P. N., & Massanari, A. (2007). Learning to search and searching to learn: Income, education, and experience online. *Journal of Computer-Mediated Communication*, 12(3).
- Johnson, T.J. & Kaye, B. K. (2002). Webbelievability: A path model examining how convenience and reliance predict online credibility. *Journalism and Mass Communication Quarterly*, 79(3), 619–642.
- Kafai, Y., & Bates, M. (1997). Internet Web-searching instruction in the elementary classroom: Building a foundation for information literacy. *School Library Media Quarterly*, 25(2), 8.
- Kayahara, J., & Wellman, B. (2007). Searching for culture – High and low. *Journal of Computer Mediated Communication*, 12(3).
- Kuiper, E., Volman, M. et al. (2005). The Web as an information resource in K–12 Education: Strategies for supporting students in searching and processing information. *Review of Educational Research*, 75(3), 285–328.
- Livingstone, S. (2004). Media literacy and the challenge of new information and communication technologies. *The Communication Review*, 7(1), 3–14.
- Livingston, S., & Helsper, E. (2007). Gradations in digital inclusion: Children, young people, and the digital divide. *New Media & Society*, 9(4), 671–696.
- Madden, M. (2006). Internet penetration and impact. Washington, D.C.: Pew Internet and American Life Project.
- Markey, K. (2007). Twenty–five years of end-user searching part 1: Research findings. *Journal of the American Society for Information Science and Technology*, 58(8), 1071–1081.
- Menchen-Trevino, E. & Hargittai, E. (In Press). Online credibility assessment by a diverse group of young adults: The case of Wikipedia. *Information, Communication and Society*.
- Meola, M. (2004). Chucking the checklist: A contextual approach to teaching undergraduates Web-site evaluation. *Portal: Libraries and the Academy*, 4(3), 331–344.
- Metzger, M. J. (2005). Understanding how Internet users make sense of credibility: A Review of the state of our knowledge and recommendations for theory, policy, and practice. Paper presented at the

- Internet Credibility and the User Symposium, sponsored by the American Library Association's Office for Information Technology Policy, Seattle, WA.
- Metzger, M. J. (2007). Making sense of credibility on the Web: Models for evaluating online information and recommendations for future research. *Journal of the American Society for Information Science and Technology*, 58(13), 2078–2078.
- Metzger, M. J., Flanagin, A. J., & Zwarun, L. (2003). College student Web use, perceptions of information credibility, and verification behavior. *Computers and Education* (41), 271–290.
- National Telecommunications and Information Administration. (2004). A Nation online: Entering the broadband age. Washington, D.C.: NTIA.
- Pan, B., Hembrooke, H., Joachims, T., Lorigo, L., Gay, G., & Granka, L. (2007). In Google we trust: Users' decisions on rank, position and relevancy. *Journal of Computer-Mediated Communication*, 12(3).
- Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon*, 9:1–6.
- Rainie, L., & Tancer, B. (2007). Wikipedia Users. Washington, D.C.: Pew Internet & American Life Project.
- Rieh, S. Y., & Hilligoss, B. (2007). College students' credibility judgments in the information seeking process. In M. J. Metzger & A. J. Flanagin (Eds.), *Digital Media, Youth, and Credibility* (pp.49-71). Cambridge, MA: The MIT Press.
- Sundar, S. S. (2007). The MAIN model: A heuristic approach to understanding technology effects on credibility. In M. J. Metzger & A. J. Flanagin (Eds.), *Digital Media, Youth, and Credibility* (pp. 73–100). Cambridge, MA: The MIT Press.
- Tapscott, D. (1998). *Growing up digital: The Rise of the Net Generation*. New York: McGraw Hill.
- Tepper, S. J., Hargittai, E., & Touve, D. (2007). Music, mavens, and technology. In S. J. Tepper & B. Ivey (Eds.), *Engaging Art: The Next Great Transformation of America's Cultural Life*, pp. 199–220, New York: Routledge.
- Tombros, A., Ruthven, I., & Jose, J. (2005). How users assess Web pages for information-seeking. *Journal of the American Society for Information Science and Technology*, 56, 327–344.
- Tseng, S., & Fogg, B. J. (1999). Credibility and computing technology. *Communications of the ACM*, 42(5), 39–44.
- U.S. News and World Report*. (2006). *Campus Ethnic Diversity: National Universities. America's Best Colleges 2007*.

Wasserman, I. M., & Richmond-Abbott, M. (2005). Gender and the Internet: Causes of variation in access, level, and scope of use. *Social Science Quarterly*, *86*(1), 252–270.

Wathen, C. N., & Burkell, J. (2002). Believe it or not: Factors influencing credibility on the Web. *Journal of the American Society for Information Science and Technology*, *53*(2), 134–144.

Wellman, B., & Haythornthwaite, C. (2002). "The Internet in Everyday Life." Oxford: Wiley-Blackwell.