

A Diary Study of Credibility Assessment in Everyday Life Information Activities on the Web: Preliminary Findings

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ABSTRACT

This study investigates how people's credibility assessment processes have evolved as they engage in increasingly diverse types of online activities beyond seeking for information or reading online news. Using an online activity diary method, information on people's online activities and their associated credibility assessment processes were collected at multiple points throughout the day for three days. This paper reports on a preliminary analysis of 2,471 diary entries received from 333 respondents. Content analysis was applied to people's descriptions of their online activities, yielding 17 different types of information objects and 26 categories of online content. People's credibility judgments were examined on three levels: construct, heuristics, and interaction. The results, although preliminary, indicate that distinct credibility assessment heuristics are in fact emerging as people engage in online activities involving more user-generated and multimedia content. The unique contribution of this paper is its identification of the importance of taking a heuristic approach to credibility assessment by studying a large sample of heavy Internet users within the context of the everyday life information activities they conduct online.

Keywords

Information credibility, credibility assessment, diary study, everyday life information activities, Web 2.0, user-generated content.

INTRODUCTION

The vast majority of research on credibility judgments of online information has focused on somewhat limited online activities such as seeking information (Rieh, 2002), reading online news (Sundar, 1999), using online political information (Johnson & Kaye, 2000), or using personal web pages (Flanagin & Metzger, 2003). As people increasingly engage in diverse online activities such as creating, tagging, and rating content, shopping, and listening to and watching

multimedia content, their credibility assessments have grown more complicated and multi-dimensional. In the Web 2.0 environment, people interact with various forms or tools of online information, such as blogs, wikis, photos, videos, music, forums, and social networking sites. This Web 2.0 environment poses new challenges for people because the burden of information evaluation shifts from professional gatekeepers to individual information consumers (Flanagin & Metzger, 2008). This is because it is increasingly difficult to identify the original source of information as more individual users create and mediate content. At the same time, people now have greater opportunity to use tools and features that can help them to make more informed credibility assessments by relying on other people's recommendations, annotations, and ratings.

Meanwhile, previous studies have found that people's credibility judgments are closely related to the information seeking goals that motivate them to engage in information activities. Previous research shows that people are more concerned with credibility issues when they are looking for information relative to academic achievement, problem solving, and personal information needs rather than to entertainment or routine work (Rieh & Hilligoss, 2008). Varying levels of concern regarding credibility also relate to people's perceptions about the consequences of information use (Rieh & Belkin, 1998). For instance, Rieh and Belkin's participants showed greater concern about the credibility of health and travel information than other types of online information because of the potentially direct impact of this information on their lives. While these findings are consistent and intriguing, the majority of the studies have been conducted using small samples consisting primarily of academic users with the exception of Fogg et al.'s (2003) study of 2,500 participants drawn from the general public. Fogg et al.'s study did not, however, incorporate online activities or user goals into their survey questions. Therefore, a large-scale study of credibility assessment is needed to examine a broader scope of online information activities conducted by a more diverse sample of study participants.

The purpose of this study is to identify how people's credibility assessments differ when they use user-generated content and multimedia websites such as wikis, blogs, videos, forums, music, photos, and social networking sites,

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as opposed to when they use traditional types of websites such as news sites, e-commerce sites, search engines, and other general types of websites. Two additional goals of this study are to examine to what extent the concepts and measures of credibility assessment developed within the context of traditional website use are applicable to Web 2.0-oriented websites and to determine what new information credibility perceptions and heuristics have emerged in the participatory web environment.

For this study, Hilligoss and Rieh's (2008) framework of credibility assessment has been employed and expanded. Their framework suggests that three distinct levels of credibility judgments exist: construct, heuristics, and interaction. The construct level pertains to how people construct, conceptualize, and define credibility. The heuristics level involves general rules of thumb that people use to make credibility judgments within a variety of situations. The interaction level refers to credibility judgments that are based on specific content, information objects, and sources within a specific information use situation. This framework indicates that credibility judgments can be better understood by taking into consideration the complex nature and multiple levels of credibility judgments, going beyond simply focusing on the cues or criteria that people systematically use when assessing credibility.

Specifically, the study addresses the following research questions:

1. How do people's credibility constructs differ when they use traditional web content versus when they use user-generated content?
2. How do people's credibility assessment heuristics relate to the different types of information objects that they use?
3. How do people's interactions with content for credibility assessment differ depending on the type of online content that they use?
4. What new credibility assessment constructs, heuristics, and interaction patterns have emerged in the participatory Web environment?

In order to address these research questions, it was necessary to study rather heavy users of the Internet who have embraced online activities as a part of their daily routines. Therefore, we decided to recruit people who use the Internet multiple times daily within their everyday life context. Combining both the diary study method and the Experience Sampling Method (Kubey, Larson, & Csikszentmihalyi, 1996), people's survey responses describing their online activities and credibility assessment processes were collected at multiple points throughout the day, from 333 respondents who submitted a total of 2,471 diary entries.

LITERATURE REVIEW

It is widely recognized that credibility is a complex and multi-dimensional concept that can be defined with respect

to more than a dozen other related concepts (Rieh, 2010). In a pioneering study, Hovland, Janis, and Kelley (1953) identified trustworthiness and expertise as the two key dimensions of the credibility concept. Since Hovland et al.'s conceptualization of credibility, numerous related concepts have emerged to operationalize or measure people's credibility perceptions. Empirical studies have often asked study respondents whether they perceive information to be believable, trustworthy, fair, accurate, trustful, complete, in-depth, unbiased, objective, reliable, and authoritative (e.g., Bucy, 2003; Johnson & Kaye, 2000; Sundar, 1999). The majority of these studies investigated credibility assessment within the context of newspapers, TV news, online news, and online political information. Therefore, the question is raised as to whether or not these concepts remain effective for examining credibility assessment within a broad range of online content and online activities.

Few studies to date have looked at credibility issues with respect to social tools and applications available within the Web 2.0 environment. For instance, Metzger, Flanagin, and Medders (2009) investigated how people perceive the credibility of information obtained through the use of social computing tools and applications. By analyzing focus group data collected from 109 participants, Metzger et al. found that people rely on feedback systems, testimonials, and reputation systems when making credibility assessments. Their study showed that many participants distinguished subjective and objective information, taking greater care to assess credibility when dealing with subjective information.

Previous research has also revealed that people's perceptions of credibility differ depending on the types of information or genres of Websites under evaluation. Flanagin and Metzger (2000) found that news and reference information obtained on the Web was rated as more credible than entertainment or commercial information obtained on the Web. The participants of Rieh's (2002) study were more concerned about information quality and cognitive authority when they were seeking either health-related information or information for research projects than when they were looking for product- or travel-related information. In their survey study, Fogg et al. (2003) chose 100 websites that represented 10 content types, such as e-commerce, entertainment, finance, health, news, nonprofit, opinion/review, Web searching, sports, and travel. The results of their survey suggest that content is a factor that affects the kinds of things that respondents tend to notice on these different types of Websites.

Recently, Sundin and Francke (2009) found that young people who participated in their study used "genre awareness" for their credibility assessment. Two different genres that came up frequently in their study were blogs and encyclopedias. Young people treated blogs as a forum for expressing opinions as opposed to presenting facts. Also, facts and opinions were perceived as a clear-cut dichotomy in the process of information seeking. On the

other hand, encyclopedias were perceived as delivering facts. In the case of Wikipedia, Sundin and Francke's study participants showed "genre conflicts" because "the style is encyclopaedic and thus perceived as trustworthy, but the collaborative construction process with many anonymous authors made the pupils suspicious when it came to its credibility."

Taking into account the findings and issues from previous studies, this study was designed to investigate credibility assessment within the context of everyday life information activities.

RESEARCH METHODS

An Online Information Activity Diary Survey

Because we wanted to investigate the online activities that people conducted at various times throughout the day within their everyday context, we chose to conduct a diary survey that allowed us to capture information about whatever people were working on at each of various times. Study participants received an email with a link to an online activity diary form five times a day over a period of three days. Sunday, Monday, and Tuesday were chosen in order to capture people's online information activities on weekends as well as weekdays. The emails were sent out at the following times each day: 9:00 AM, 12:30 PM, 4:00 PM, 7:00 PM, and 10:00 PM. Even though a total of 15 emails with survey links to each participant were sent out, respondents were expected to respond to the survey at least once a day for three consecutive days. If a participant failed to respond on any of the three days, they were excluded from our sample.

Survey Respondents

Respondents were recruited using a random sample of landline phone numbers belonging to Michigan residents. Potential respondents were screened to assure that they: (1) were at least 18 years of age; (2) had Internet access from home and from school or work (as applicable); (3) went on the Web every day (including Saturday and Sunday) to conduct activities other than or in addition to e-mail; and (4) spent a total of at least one hour per day on the Web, excluding time spent on e-mail. A two-tier incentive system for monetary compensation was used. Respondents who completed nine (at least three each day) were offered a larger incentive than were those respondents who completed three (at least one each day).

Data Collection

Before collecting the survey data, we administered a background questionnaire that asked for basic demographic information, hours spent online, and ability to conduct various types of online activities. Once respondents had submitted their background questionnaire, they were set up in the system so that they would then receive e-mails with links to the online activity diary survey.

The diary survey first asked respondents to report all online activities (other than e-mail) in which they had engaged during the preceding three hours. After marking all

activities in which they had been engaged, respondents were then asked to answer two open-ended questions by describing the one activity on which they had spent the most time during the preceding three hours, including what they were trying to accomplish by conducting this one activity, from what site they had conducted this activity, and how long they had spent on this activity. They were then asked to rate their interest, confidence, and satisfaction regarding this activity. The remaining four diary questions focused on respondents' credibility assessments made during this one activity. Respondents were asked to rate the importance of 11 different credibility constructs, such as whether the information was written/created by an expert, whether the information was from an official source, and whether the information was trustworthy. They were then asked to rate how much they trusted the information they chose for this activity. Respondents were also asked to indicate the heuristics they employed when deciding what information to use for their one activity. The last question asked respondents about the action(s) they had performed to ensure whether they could trust the information.

Data Analysis

After removal of incomplete and inappropriate records, the data set had 2,471 diaries submitted by 333 respondents. The first step in preparing this data for analysis was to code the responses to the two open-ended questions regarding participants' one activity and their reason for conducting this activity. Coding schemes for respondents' responses to these questions were developed iteratively using content analysis. Respondents' narrative descriptions were coded using four different types of codes: (1) goals and intentions; (2) behavior; (3) type of information object; and (4) type of information content. Respondents' descriptions of what they were trying to accomplish in conducting their online activity were coded in terms of goals and intentions. Behavior codes were used to represent the specific action(s) that the respondents described taking. The types of information object codes were used to represent the genre of the Websites. The genre was characterized in terms of 16 different types of information objects. Information content categories were used to represent the content that respondents described accessing on the Web. 25 different types of information content were identified.

In the remainder of this paper, we report the preliminary findings from the data analysis, focusing on the relationships between the types of information objects and information content that respondents described and their responses to credibility-related questions. Findings related to other sets of variables, such as behavior, user goals and intentions, motivation, confidence, and satisfaction, will be reported in another paper.

FINDINGS

Characteristics of Respondents

Our 333 respondents were geographically dispersed across the state of Michigan. Approximately 60% were female, and approximately 40% were male. They were spread out across all age groups, with somewhat higher concentrations in the middle to older age groupings (35-44, 45-54, and 55-64). They had varying educational attainment levels; however, our sample was better educated, on average, than Michigan as a whole. Nearly half of our sample had college degrees; however, just 21.8% of Michigan residents have earned a Bachelor's degree or higher (U.S. Census Bureau, 2000). They also represented a wide range of occupations – 25% reported some type of professional occupation, 13% reported a managerial occupation, and 13% indicated that they did clerical work. Nearly 10% of our respondents were homemakers and just over 3% were students. Retired and unemployed respondents constituted nearly 20% of our sample.

Levels of Trust in Different Information Objects

When respondents were queried about the one online activity on which they had spent the most time during the preceding 3 hours, the most frequently mentioned categories of information objects were general website (25.9%), news site (18.8%), and e-commerce site (15.4%). While the majority of respondents described one information object when describing their one activity, 176 entries (7%) reported two information objects, and 14 entries (0.6%) reported three different information objects.

Respondents were asked to indicate the extent to which they trusted the information that they decided to select by using a 7-point scale (1=not at all, 4=somewhat, 7=very much). As presented in Table 1, respondents reported having the least trust in blogs ($M=5.95$), forums ($M=6.00$), videos ($M=6.06$), and wikis ($M=6.13$). In the responses, there was a mix of user-generated content sites (e.g. MySpace, YouTube) and official sites (e.g. Pandora, hulu.com) for both videos and music, yet music ($M=6.44$) was more trusted than videos ($M=6.06$). Videos were also rated lower than photos ($M=6.44$). Respondents trusted applications and forms to the greatest extent ($M=6.75$), followed by online course ($M=6.57$), TV/radio/podcast ($M=6.52$), and article/e-book ($M=6.47$).

Credibility Constructs and Information Objects

Table 2 and Table 3 reveal how respondents' perceptions of the importance of each of 11 credibility constructs varied depending on the type of information object they described using. Whereas Table 2 lists information objects that may be considered more like traditional websites, Table 3 includes information objects that are better described as user-generated content (UGC) and/or multimedia. Looking across both tables, the differences lie more in the relative ratings of importance than in the kinds of constructs. Accuracy ($M=6.50$), currency ($M=6.44$), reliability

Type of information object	n	%	Trust	
			M (SD)	Rank
General website	692	25.9%	6.39 (0.92)	7
News site	503	18.8%	6.30 (0.92)	9
E-commerce site	411	15.4%	6.32 (1.04)	8
Social networking site	255	9.5%	6.24 (1.05)	10
Search engine	147	5.5%	6.23 (0.94)	11
Video	111	4.1%	6.06 (1.23)	15
Music	86	3.2%	6.44 (0.84)	5
Forum	84	3.1%	6.00 (1.01)	16
Game	83	3.1%	6.17 (1.44)	13
Blog	67	2.5%	5.95 (1.29)	17
Unspecified	67	2.5%	6.21 (1.21)	12
Photos	54	2.0%	6.44 (0.78)	6
TV/radio/podcast	29	1.1%	6.52 (0.87)	3
Wiki	24	0.9%	6.13 (0.99)	14
Online course	23	0.9%	6.57 (0.60)	2
Application/form	20	0.7%	6.75 (0.72)	1
Article/e-book	19	0.7%	6.47 (1.12)	4
Total	2,675	100.00%	6.30 (1.00)^a	

Table 1: Reported levels of trust in different information objects

^aThe reported total mean and standard deviation are computed from the 2,471 diary entries.

($M=6.44$), truthfulness ($M=6.35$), and trustworthiness ($M=6.33$) were the top five credibility constructs for traditional websites (Table 2). This list itself was not much different from the list of top credibility constructs for UGC and multimedia sites (Table 3). The ratings of perceived importance were consistently lower in regard to UGC and multimedia information objects than they were in regard to traditional websites. The constructs of authority and expert author/creator show this difference clearly. The importance of authoritativeness was rated as 5.29 in traditional websites versus just 3.76 with regard to UGC/multimedia information objects. When asked about the importance of whether the information was created/written by an expert, the rating was 5.54 for traditional websites versus 3.87 for UGC/multimedia. Respondents reported that "information is scholarly" and "information is unbiased" were the least important constructs across both categories of websites.

Table 2 shows that the importance of credibility constructs varies only slightly depending on the type of information object. In the case of news sites, it was no surprise that currency ($M=6.64$) was rated as the most important. Interestingly, when a search engine was used, accuracy stood out as the most important construct. Accuracy was also an important construct in the use of e-commerce sites while trustworthiness, truthfulness, reliability, and currency were also quite highly rated. Overall, respondents tended to perceive the 11 credibility constructs to be least important for game and TV/radio/podcast sites; however, they rated most of these constructs highly when using online course, application/form, and article/e-book sites.

Type of information object	n	Credibility Constructs: How important were the following aspects?										
		Expert	Official	Trust-worthy	Truthful	Scholarly	Unbiased	Accurate	Complete	Reliable	Authoritative	Current
		M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
General website	692	5.82 (1.77)	6.24 (1.51)	6.38 (1.26)	6.43 (1.23)	4.83 (2.21)	6.07 (2.16)	6.58 (1.03)	6.42 (1.15)	6.53 (1.08)	5.54 (1.94)	6.42 (1.28)
News site	503	5.52 (1.77)	6.07 (1.41)	6.32 (1.23)	6.38 (1.23)	4.55 (2.00)	5.48 (1.82)	6.51 (1.06)	6.21 (1.28)	6.42 (1.13)	5.20 (1.84)	6.64 (0.93)
E-commerce site	411	5.06 (2.15)	5.94 (1.77)	6.43 (1.13)	6.46 (1.17)	3.76 (2.32)	4.51 (2.42)	6.52 (1.14)	6.39 (1.29)	6.48 (1.25)	4.93 (2.28)	6.47 (1.26)
Search engine	147	5.64 (1.75)	5.73 (1.76)	6.08 (1.50)	6.13 (1.49)	4.47 (2.25)	4.54 (2.32)	6.37 (1.45)	6.11 (1.45)	6.18 (1.49)	5.12 (2.14)	6.09 (1.61)
Game	83	4.43 (2.42)	5.02 (2.23)	5.93 (1.61)	5.18 (2.19)	3.54 (2.32)	3.89 (2.41)	5.65 (1.93)	5.82 (1.77)	6.03 (1.64)	4.14 (2.36)	5.56 (2.00)
Unspecified format	67	5.82 (1.82)	5.95 (1.76)	6.30 (1.51)	6.29 (1.40)	4.80 (2.35)	4.95 (2.22)	6.38 (1.50)	6.31 (1.31)	6.42 (1.34)	5.49 (2.14)	6.33 (1.46)
TV/radio/podcast	29	5.23 (2.25)	5.75 (2.05)	5.54 (1.82)	5.48 (1.97)	4.05 (2.58)	4.22 (2.53)	6.05 (1.62)	6.08 (1.64)	6.12 (1.74)	4.21 (2.42)	5.88 (2.03)
Online course	23	6.11 (1.49)	6.37 (0.96)	6.65 (0.75)	6.58 (0.90)	6.53 (1.12)	6.00 (2.00)	6.60 (0.99)	6.37 (1.57)	6.60 (1.14)	5.90 (2.10)	6.61 (0.85)
Application/form	20	6.06 (1.26)	6.85 (0.49)	6.90 (0.45)	6.89 (0.46)	4.85 (2.12)	5.69 (1.80)	6.95 (0.22)	6.89 (0.32)	6.80 (0.52)	6.28 (1.49)	6.89 (0.32)
Article/e-book	19	6.83 (0.51)	6.61 (1.04)	6.67 (0.69)	6.67 (0.59)	6.53 (0.83)	6.47 (0.74)	6.72 (0.57)	6.50 (0.86)	6.72 (0.57)	6.28 (1.07)	6.27 (1.53)
Total :	M (SD)	5.54 (1.90)	6.06 (1.61)	6.33 (1.28)	6.35 (1.31)	4.56 (2.22)	5.06 (2.16)	6.50 (1.14)	6.31 (1.29)	6.44 (1.21)	5.29 (2.03)	6.44 (1.28)
	n	1,627	1,743	1,769	1,725	1,359	1,381	1,748	1,748	1,775	1,479	1,719

Table 2: Importance of different credibility constructs depending on type of information object (traditional websites)

As seen in Table 3, respondents tended to care more about credibility issues when using wiki sites versus blogs or social networking sites. For social networking sites, currency was rated highest ($M=5.80$), while truthfulness ($M=5.44$) and trustworthiness ($M=5.28$) were rated relatively higher than the other credibility constructs although none of the 11 constructs were rated higher than 6 on our 7-point scale. In the case of blogs, currency ($M=6.05$) was the only construct which was rated higher than 6. When respondents reported using multimedia sites, the results were somewhat different from those found to be based on their use of UGC sites. In addition to identifying reliability, currency, and accuracy as important constructs, which were also rated as highly important when using other types of information objects, completeness was rated as the second most important construct for music and as the third

most important construct for photos.

Credibility Heuristics and Information Objects

When asked how they decided which information to select, respondents' most frequently mentioned heuristics was "I selected the information because it was from a site that I am familiar with" for both traditional websites (66.4%) (see Table 4) and UGC/multimedia sites (66.6%) (see Table 5). For traditional websites, the next most frequently used heuristics was "I selected the information because it was provided by organizations that I know" (27.7%) and "I selected the information because it was from a popular site" (26.5%). In the case of UGC/multimedia sites, respondents were more likely to choose the information because "it was from a popular site" (30.8%) or "it was recommended by individuals that I know" (22.0%) rather than "it was provided by organizations that I know" (8.6%).

Type of information object	n	Credibility Constructs: How important were the following aspects?										
		Expert	Official	Trust-worthy	Truthful	Scholarly	Unbiased	Accurate	Complete	Reliable	Authoritative	Current
		M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
Social networking site	255	3.06 (2.27)	4.18 (2.46)	5.28 (1.95)	5.44 (1.85)	2.82 (2.13)	3.28 (2.22)	5.22 (2.07)	4.80 (2.14)	5.22 (2.10)	3.13 (2.22)	5.80 (1.66)
Video	111	4.36 (2.38)	5.12 (2.17)	5.37 (2.09)	5.31 (2.02)	3.88 (2.46)	4.27 (2.20)	5.70 (1.79)	5.62 (1.91)	5.69 (1.98)	4.60 (2.25)	5.77 (1.76)
Music	86	4.44 (2.35)	5.45 (1.93)	6.03 (1.57)	5.48 (1.92)	3.58 (2.42)	3.34 (2.40)	6.09 (1.49)	6.17 (1.52)	6.31 (1.42)	3.97 (2.44)	6.13 (1.61)
Forum	84	3.77 (2.39)	4.49 (2.17)	5.45 (1.75)	5.73 (1.58)	2.84 (2.17)	4.09 (2.15)	5.48 (1.80)	5.05 (1.87)	5.26 (1.90)	3.83 (2.14)	5.95 (1.49)
Blog	67	4.11 (2.43)	4.10 (2.33)	5.25 (2.00)	5.69 (1.86)	3.53 (2.44)	3.64 (2.31)	5.43 (2.00)	5.00 (2.02)	5.28 (2.07)	3.81 (2.30)	6.05 (1.77)
Photos	54	4.43 (2.28)	4.73 (2.27)	5.75 (1.48)	5.71 (1.54)	3.83 (2.28)	4.16 (2.32)	6.00 (1.24)	6.00 (1.33)	6.25 (1.22)	4.25 (2.15)	6.18 (1.38)
Wiki	24	5.48 (1.88)	5.42 (2.12)	6.09 (1.09)	6.04 (1.26)	4.95 (2.06)	4.85 (2.21)	6.13 (1.15)	5.21 (1.91)	6.09 (1.24)	4.45 (2.22)	5.59 (1.79)
Total :	M (SD)	3.87 (2.41)	4.64 (2.31)	5.45 (1.90)	5.52 (1.84)	3.32 (2.34)	3.71 (2.28)	5.52 (1.89)	5.24 (2.01)	5.51 (1.96)	3.76 (2.32)	5.88 (1.67)
	n	420	446	486	475	382	405	485	500	502	388	530

Table 3: Importance of different credibility constructs depending on type of information object (user-generated content sites and multimedia sites)

Type of information object	n	Credibility Heuristics: How did you decide which information to select?										
		From a site I'm familiar with	From a popular site	Recommended by individuals I know	Recommended by experts	Provided by organizations that I know	From a site that appeared to be well-designed	Writing was easy to understand	I did not pay attention to any of these aspects	I didn't use the info. because I couldn't trust the site	Other	None of the above
		n %	n %	n %	n %	n %	n %	n %	n %	n %	n %	n %
General website	692	387 55.9%	137 19.8%	137 19.8%	144 20.8%	241 34.8%	121 17.5%	138 19.9%	44 6.4%	3 0.4%	78 11.3%	36 5.2%
News site	503	437 86.9%	165 32.8%	50 9.9%	37 7.4%	139 27.6%	61 12.1%	68 13.5%	18 3.6%	4 0.8%	13 2.6%	10 2.0%
E-commerce site	411	277 67.4%	137 33.3%	67 16.3%	32 7.8%	77 18.7%	74 18.0%	59 14.4%	23 5.6%	3 0.7%	30 7.3%	21 5.1%
Search engine	147	72 49.0%	36 24.5%	19 12.9%	29 19.7%	40 27.2%	28 19.1%	29 19.7%	22 15.0%	3 2.0%	14 9.5%	6 4.1%
Game	83	55 66.3%	26 31.3%	13 15.7%	1 1.2%	6 7.2%	8 9.6%	8 9.6%	3 3.6%	1 1.2%	6 7.2%	16 18.1%
Unspecified format	67	37 55.2%	9 13.4%	8 11.9%	13 19.4%	18 26.9%	11 16.4%	9 13.4%	4 6.0%	1 1.5%	9 13.4%	4 6.0%
TV/radio/podcast	29	22 75.9%	9 31.0%	14 48.3%	3 10.3%	10 34.5%	2 6.9%	0 0.0%	0 0.0%	1 3.5%	3 10.3%	2 6.9%
Online course	23	11 47.8%	3 13.0%	7 30.4%	7 30.4%	10 43.5%	4 17.4%	4 17.4%	0 0.0%	0 0.0%	6 26.1%	1 4.4%
Application/form	20	7 35.0%	2 10.0%	2 10.0%	5 25.0%	9 45.0%	4 20.0%	3 15.0%	0 0.0%	0 0.0%	6 30.0%	1 5.0%
Article/e-book	19	10 52.6%	0 0.0%	4 21.1%	5 26.3%	10 52.6%	1 5.3%	3 15.8%	0 0.0%	0 0.0%	5 26.3%	0 0.0%
Total^a		1,269 66.4%	506 26.5%	310 16.2%	263 13.8%	530 27.7%	304 15.9%	309 16.2%	101 5.3%	14 0.7%	156 8.2%	93 4.9%

Table 4: Use of different credibility heuristics depending on type of information object (traditional Websites)

^aTotals based on 1,912 diary entries.

Respondents were more likely to employ no credibility heuristics when using UGC/multimedia sites (12.5%) than when using traditional websites (4.9%).

In an explanation of individual information object types in Table 4, the heuristics “I selected the information because it was from a site that I am familiar with” was most commonly used when participants were accessing news information (86.9%). On the contrary, familiarity with a site was not a commonly applied heuristics when respondents used applications/forms (35.0%), search engines (9.0%), online courses (7.8%), games (6.3%), TV/radio/podcasts (5.9%), and articles/e-books (2.6%). The heuristics related to source – “I selected the information because it was provided by organizations that I know” – was more frequently reported when respondents used article/e-books (52.6%), application/forms (45.0%), and online courses

(43.5%). The popularity heuristics “I selected the information because it was from a popular site” was frequently mentioned by respondents when they used e-commerce sites (33.3%), news sites (32.8%), games (31.3%), and TV/radio/podcasts (31.0%). The recommendations heuristics “I selected the information because it was recommended by individuals that I know” seemed to matter most when respondents used TV/radio/podcasts (48.3%).

Table 5 shows that the credibility heuristics employed by respondents using user-generated and multimedia content vary considerably depending on the specific types of information objects they use. Credibility related to wiki sites stood out because familiarity (83.3%) and popularity (54.1%) were mentioned much more frequently in relation to wikis than in relation to other types of information

Type of information object	n	Credibility Heuristics: How did you decide which information to select?										
		From a site I'm familiar with	From a popular site	Recommended by individuals I know	Recommended by experts	Provided by organizations that I know	From a site that appeared to be well-designed	Writing was easy to understand	I did not pay attention to any of these aspects	I didn't use the info. because I couldn't trust the site	Other	None of the above
		n %	n %	n %	n %	n %	n %	n %	n %	n %	n %	n %
Social networking site	255	163 63.9%	77 30.2%	49 19.22%	6 2.4%	8 3.1%	15 5.9%	16 6.3%	14 5.5%	0 0.0%	11 4.3%	47 18.4%
Video	111	83 74.8%	48 43.2%	29 26.1%	12 10.8%	16 14.4%	19 17.1%	9 8.1%	7 6.3%	0 0.0%	7 6.3%	11 9.9%
Music	86	61 70.9%	34 39.5%	23 26.7%	5 5.8%	3 3.5%	17 19.8%	9 10.5%	0 0.0%	2 2.3%	3 3.5%	8 9.3%
Forum	84	61 72.6%	11 13.1%	18 21.4%	11 13.1%	16 19.1%	7 8.3%	10 11.9%	6 7.1%	1 1.2%	6 7.1%	6 7.1%
Blog	67	39 58.2%	12 17.9%	15 22.4%	3 4.5%	11 16.4%	8 11.9%	13 19.4%	5 7.5%	0 0.0%	11 16.4%	3 4.5%
Photos	54	25 46.3%	16 29.6%	13 24.1%	3 5.6%	1 1.9%	5 9.3%	3 5.6%	6 11.1%	1 1.9%	1 1.9%	13 24.1%
Wiki	24	20 83.3%	13 54.1%	6 25.0%	2 8.3%	4 16.7%	2 8.3%	4 16.7%	0 0.0%	0 0.0%	1 4.2%	0 0.0%
Total^a		426 66.6%	197 30.8%	141 22.0%	39 6.1%	55 8.6%	69 10.8%	57 8.9%	34 5.3%	4 0.6%	40 6.3%	80 12.5%

Table 5: Use of different credibility heuristics depending on type of information object (user-generated content sites and multimedia sites)

^aTotals based on 640 diary entries.

objects. In the case of forums, respondents relied on whether the information was recommended by experts (13.1%) or whether it was provided by organizations that they knew (19.1%), which was not so much the case with other types of information objects. The writing heuristics “the writing was easy to understand” mattered more for blogs (19.4%) and wikis (16.7%) than for forums (11.9%) and social networking sites (6.3%). Design was mentioned more frequently with respect to music (19.8%) and videos (17.1%) than in connection with photos (9.3%) and blogs (11.9%).

Levels of Trust in Different Content Types

As mentioned above, the data analysis of content types yielded 25 categories. When respondents were asked to describe their online activities, they tended to describe their behavior in terms of websites, not necessarily writing about specific content. As a result, a large portion of unspecified content (21.4%) was to be found in the analysis. Table 6 shows that the most frequently reported content types were product/service information (18.1%), news (14.0%), and information about people (10.5%). When asked to report on their one online activity, 2,266 (91.7%) diary entries described one type of content while 184 diary entries (7.4%) described two content types, 17 (0.7%) described included three content types, and 4 (0.2%) described four content types.

We were interested in comparing the extent to which people’s trust in information differed depending on the type of content with which they were working. Using a 7-point scale (1=not at all, 4=somewhat, and 7=very much),

respondents reported that they trusted their personal records to the greatest extent ($M=6.84$), followed by their trust in teaching/instructions ($M=6.69$), schedules ($M=6.63$), travel information ($M=6.57$), directions ($M=6.53$), addresses/phone numbers ($M=6.53$), and genealogy information ($M=6.53$). Opinions ($M=5.54$) and product/service reviews ($M=5.18$) were trusted the least.

Credibility Interaction and Content Types

To examine the interaction level of people’s credibility assessment processes, we posed the following question: “Which of the following actions did you take to make sure whether you could trust the information?” For analysis purposes, we divided the types of content into two categories: factual information (Table 7) and exploratory information (Table 8). In the first category (factual information), we included look-up type content, such as personal records, schedules, phone numbers, and weather. In the second category (exploratory information), we included types of content that are more likely to lend themselves to exploration, such as news, health information, and genealogy information.

Not surprisingly, respondents more frequently engaged in interactions with exploratory information than with factual information. The first two most frequently reported interactions were the same for both categories: “looked at who was responsible for this information” and “looked at just the content, paying no attention to attributes described above.” Respondents reported that they consulted other sources to validate the information they found more frequently when they were using exploratory information (20.4%) rather than factual information (17.1%). While respondents rarely tracked down the original source for factual information (5.1%), they were more likely to do so when using exploratory information (10.5%).

As presented in Table 7, respondents made credibility assessments by looking at who was responsible for the information more frequently when they used stock information (51.2%), schedules (50.0%), and weather (43.4%) than when they used other types of content. Respondents were more likely to consult other sources to validate the information they found when they were looking up stock information (25.6%) and schedules (20.8%) than when using other types of content. Overall, respondents tended not to extensively examine the website design (6.2%). Design mattered relatively more when respondents used travel information (10.9%). Respondents were more likely to look at whether the information was well-written when using stock information (16.3%), directions (15.8%), product/service information (14.3%), travel information (10.9%), and weather (10.3%) than when they used other content types.

Type of Content	n	%	Trust	
			M (SD)	Rank
Unspecified content	578	21.4%	6.26 (1.04)	16
Product/Service information	488	18.1%	6.32 (0.98)	12
News	379	14.0%	6.24 (0.92)	18
Information about people	284	10.5%	6.15 (1.14)	20
Weather	136	5.0%	6.40 (0.83)	9
Health information	118	4.4%	6.29 (1.10)	14
Sports	115	4.3%	6.36 (0.96)	10
Jobs	68	2.5%	6.26 (0.92)	16
Personal records	64	2.4%	6.84 (0.51)	1
Info. about organizations	52	1.9%	6.29 (0.87)	14
Travel information	46	1.7%	6.57 (0.69)	4
Teaching/Instructions	45	1.7%	6.69 (0.63)	2
Stock information	43	1.6%	6.30 (0.80)	13
Opinions	38	1.4%	5.54 (1.61)	25
Genealogy information	31	1.1%	6.53 (0.86)	5
Recipes/Cooking information	29	1.1%	6.36 (1.19)	10
Schedules	24	0.9%	6.63 (0.77)	3
Product/Service reviews	22	0.8%	5.18 (1.40)	26
Movie/TV information	20	0.7%	6.20 (0.83)	19
Directions	19	0.7%	6.53 (0.77)	5
Pet information	19	0.7%	6.05 (1.03)	23
Addresses/Phone numbers	18	0.7%	6.53 (0.87)	5
History information	18	0.7%	6.06 (0.80)	21
Political Information	16	0.6%	6.06 (1.18)	21
Science Information	16	0.6%	6.44 (0.73)	8
Real estate	15	0.6%	5.87 (1.41)	24
Total	2,701	100.0%	6.29 (1.00)^a	

Table 6: Reported levels of trust in different information content

^aThe reported total mean and standard deviation are computed from the 2,471 diary entries.

Type of information content	n	Credibility Interactions: Which action(s) did you take to make sure you could trust the information?									
		Looked at who was responsible	Looked at the author's qualifications	Tracked down the original source	Looked at who linked to the information	Consulted other sources to validate	Examined the design of website	Made sure the information was well-written	Looked just at the content, paying no attention to these attributes	Other	None of the above
		n %	n %	n %	n %	n %	n %	n %	n %	n %	n %
Product/service info.	488	175 35.9%	70 14.3%	29 5.9%	46 9.4%	93 19.1%	39 8.0%	70 14.3%	103 21.1%	54 11.1%	84 17.2%
Weather	136	59 43.4%	16 11.8%	1 0.7%	12 8.8%	18 13.2%	7 5.1%	14 10.3%	31 22.8%	10 7.4%	30 22.1%
Sports	115	40 34.8%	9 7.8%	6 5.2%	10 8.7%	15 13.0%	3 2.6%	9 7.8%	40 34.8%	9 7.8%	20 17.4%
Personal record	64	25 39.1%	3 4.7%	3 4.7%	7 10.9%	8 12.5%	2 3.1%	3 4.7%	12 18.8%	12 18.8%	15 23.4%
Travel information	46	17 37.0%	2 4.3%	1 2.2%	7 15.2%	9 19.6%	5 10.9%	5 10.9%	13 28.3%	7 15.2%	5 10.9%
Stock information	43	22 51.2%	4 9.3%	2 4.7%	1 2.3%	11 25.6%	2 4.7%	7 16.3%	10 23.3%	3 7.0%	8 18.6%
Schedules	24	12 50.0%	2 8.3%	4 16.7%	5 20.8%	5 20.8%	2 8.3%	1 4.2%	5 20.8%	2 8.3%	1 4.2%
Movie/TV information	20	5 25.0%	0 0.0%	2 10.0%	4 20.0%	2 10.0%	0 0.0%	2 10.0%	6 30.0%	1 5.0%	3 15.0%
Direction	19	5 26.3%	2 10.5%	0 0.0%	1 5.3%	2 10.5%	0 0.0%	3 15.8%	8 42.1%	2 10.5%	3 15.8%
Address/Phone number	18	4 22.2%	2 11.1%	2 11.1%	0 0.0%	3 16.7%	0 0.0%	1 5.6%	7 38.9%	1 5.6%	2 11.1%
Total	973	364 37.4%	110 11.3%	50 5.1%	93 9.6%	166 17.1%	60 6.2%	115 11.8%	235 24.2%	101 10.4%	171 17.6%

Table 7: Use of different credibility interactions depending on type of information content (factual information)

Table 8 shows that across all of the different types of exploratory information reported in the study, the most frequently reported interaction was looking at who was responsible (45.7%), followed by looking at content alone (20.5%) and consulting other sources to validate the information (20.4%). Product/service reviews (68.2%), jobs (61.8%), genealogy information (61.3%), history information (61.1%), and health information (58.5%) were some examples of content types in which respondents paid

more attention to “who was responsible” for the information. In general, respondents appeared more likely to engage in one or more of these types of interactions in order to make sure they could trust the information when they dealt with genealogy, pet, job, history, political, and science information. Respondents were more likely to consistently engage in a variety of credibility interactions when working with genealogy information than when working with other types of content. The most frequently

Type of information content	n	Credibility Interactions: Which action(s) did you take to make sure you could trust the information?									
		Looked at who was responsible	Looked at the author's qualifications	Tracked down the original source	Looked at who linked to the information	Consulted other sources to validate	Examined the design of website	Made sure the information was well-written	Looked just at the content, paying no attention to these attributes	Other	None of the above
		n %	n %	n %	n %	n %	n %	n %	n %	n %	n %
Unspecified content	578	211 36.5%	95 16.4%	57 9.9%	55 9.5%	93 16.1%	38 6.6%	68 11.8%	115 19.9%	51 8.8%	134 23.2%
News	379	200 52.8%	64 16.9%	24 6.3%	40 10.6%	72 19.0%	13 3.4%	48 12.7%	94 24.8%	14 3.7%	56 14.8%
Information about people	284	110 38.7%	13 4.6%	7 2.5%	31 10.9%	13 4.6%	10 3.5%	16 5.6%	65 22.9%	13 4.6%	87 30.6%
Health information	118	69 58.5%	35 29.7%	21 17.8%	22 18.6%	45 38.1%	17 14.4%	28 23.7%	13 11.0%	13 11.0%	8 6.8%
Jobs	68	42 61.8%	18 26.5%	19 27.9%	15 22.1%	24 35.3%	6 8.8%	12 17.6%	10 14.7%	3 4.4%	4 5.9%
Info. about organizations	52	27 51.9%	14 26.9%	6 11.5%	6 11.5%	19 36.5%	4 7.7%	11 21.2%	6 11.5%	5 9.6%	4 7.7%
Teaching/Instructions	45	26 57.8%	6 13.3%	1 2.2%	3 6.7%	12 26.7%	4 8.9%	9 20.0%	10 22.2%	3 6.7%	3 6.7%
Opinions	38	18 47.4%	8 21.1%	8 21.1%	6 15.8%	9 23.7%	0 0.0%	6 15.8%	11 28.9%	2 5.3%	5 13.2%
Genealogy information	31	19 61.3%	13 41.9%	20 64.5%	12 38.7%	18 58.1%	12 38.7%	10 32.3%	2 6.5%	3 9.7%	1 3.2%
Recipes/cooking	9	9 31.0%	4 13.8%	2 6.9%	3 10.3%	5 17.2%	1 3.4%	7 24.1%	6 20.7%	7 24.1%	5 17.2%
Product/service reviews	15	15 68.2%	6 27.3%	1 4.5%	2 9.1%	6 27.3%	0 0.0%	2 9.1%	4 18.2%	1 4.5%	3 13.6%
Pet information	19	8 42.1%	4 21.1%	0 0.0%	4 21.1%	11 57.9%	2 10.5%	6 31.6%	4 21.1%	2 10.5%	1 5.3%
History information	18	11 61.1%	10 55.6%	5 27.8%	3 16.7%	10 55.6%	0 0.0%	1 5.6%	4 22.2%	2 11.1%	1 5.6%
Political information	16	9 56.3%	7 43.8%	7 43.8%	5 31.3%	6 37.5%	1 6.3%	5 31.3%	3 18.8%	1 6.3%	1 6.3%
Science information	16	9 56.3%	4 25.0%	3 18.8%	5 31.3%	8 50.0%	1 6.3%	3 18.8%	2 12.5%	2 12.5%	0 0.0%
Real estate	15	6 40.0%	0 0.0%	0 0.0%	2 13.3%	2 13.3%	0 0.0%	0 0.0%	5 33.3%	0 0.0%	2 13.3%
Total	1,728	789 45.7%	301 17.4%	181 10.5%	214 12.4%	353 20.4%	109 6.3%	232 13.4%	354 20.5%	122 7.1%	315 18.2%

Table 8: Use of different credibility interactions depending on type of information content (exploratory information)

mentioned interaction in regard to genealogy information was that respondents “tracked down the original source” (64.5%). Across all types of information content, this particular interaction was selected only by 10.5% of the respondents. Respondents also “consulted other sources to validate the information” most often when encountering genealogy information (58.1%). Looking at the author’s qualifications was something respondents did more frequently when they used history information (55.6%), political information (43.8%), and genealogy information (41.9%) than they did with other types of information content.

DISCUSSION

The results of this study indicate that it is time to revisit such core dimensions of credibility as expertise and trustworthiness and to define new sets of core constructs underlying people’s credibility assessments within the online environment. Of the 11 credibility constructs we tested in this study, accuracy, currency, reliability, trustworthiness, and truthfulness were perceived to be the most important concepts across the variety of websites that respondents used. Surprisingly, authoritativeness and creator/author’s expertise, which have traditionally been considered to be the core concepts underlying credibility, ranked low in terms of importance. Of the 11 constructs, authoritativeness ranked 9th and expertise ranked 8th for both website genres. Authoritativeness was perceived to be relatively more important when respondents used applications/forms and articles/e-books. Even for news sites and e-commerce sites, selecting authoritative information was not a big concern for the respondents. Creator/author’s expertise was considered to be an important concept only when respondents used articles/e-books, online courses, and applications/forms.

The finding above supports Lankes’ (2008) research about the shift in credibility from an authority-based approach to a reliability-based approach. According to Lankes, traditional approaches to credibility emphasize authority in such a way that trusted sources are used to determine a person’s credibility judgments. However, with the reliability approach, people determine credibility by synthesizing multiple cues relevant to their credibility judgments. In the current digital media environment, as Lankes noted, there are richer resources to synthesize, which eventually enables people to make credibility judgments using participatory tools and applications. Therefore, people are more likely to make credibility judgments by incorporating multiple concepts, such as reliability, accuracy, currency, truthfulness, and trustworthiness rather than relying on a single authoritative source and one creator’s or author’s expertise. This finding also relates to another result drawn from the analysis of credibility interactions. The finding indicates that the original source of a piece of information remains an important criterion in making credibility judgments. The specific type of information content also matters to a great

deal. In addition, a significant proportion of people are likely to consult other sources to validate the information they found for the majority of their online activities.

Another finding of this study is that respondents used different heuristics depending on the type of information object they used. Hilligoss and Rieh’s (2008) study identified heuristics as rules of thumb that their participants used extensively in order to make quick credibility judgments without much substantial interaction with the information or its source. The findings of this study seem to directly relate to the social means of credibility evaluation which emphasizes bottom-up assessment of credibility constructed through collective or community effort rather than top-down assessment that defers to expertise in guiding information evaluation (Metzger, Flanagin, & Medders, 2009). The social processes inherent in credibility heuristics are more obvious not only in UGC sites but also in multimedia sites. For traditional websites, people still tend to rely on their own knowledge of and trust in organizations rather than on popularity and other people’s recommendations.

CONCLUSION

Our results, although preliminary, indicate that distinct credibility assessment heuristics are in fact emerging within the current online environment as more people engage in online activities involving user-generated and multimedia content. The ways in which people construct and operationalize credibility concepts have been extensively studied for more than five decades within several different disciplines. A number of information science researchers have investigated the types of interaction that people engage in when making credibility assessments. In comparison with credibility constructs and credibility interactions, credibility assessment heuristics have received less attention within the credibility research community. The contribution of this paper resides in its identification of the importance of taking a heuristic approach to credibility assessment by means of studying a large sample of heavy Internet users within their everyday life context.

Another novel contribution of this study is its use of the online activity diary method to capture people’s credibility assessments in everyday life information activities. The average number of diaries each respondent submitted for three days was 7.42. Collecting data multiple times per day over weekdays and weekends yielded a rich set of data which demonstrates diverse online activity contexts. For data analysis, we were able to develop typologies of information objects as well as of information content.

This study reports findings from only part of our data analysis of respondents’ background questionnaires and diary entries. We plan to further analyze the goals and intentions associated with respondents’ online activities in order to examine the relationship between the use of specific credibility assessment heuristics and the goals and intentions underlying users’ online activities. In addition,

we will investigate the relationships between users' trust in information and their motivation for a specific online activity, their confidence in their ability to conduct an online activity, and their satisfaction with the online activity. We also plan to analyze respondents' demographic backgrounds in relation to their use of particular credibility assessment heuristics. These next steps for data analysis will produce more insights and interpretations of people's credibility assessments that are closely tied to the variety of online information activities in which they actually engage within their daily life rather than merely relying on their general perceptions about their credibility assessment processes.

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