

- 1-5.
40. McGuire et al., *The Internet Handbook for Writers, Researchers, and Journalists*, 116.
41. McGuire et al., *The Internet Handbook for Writers, Researchers, and Journalists*, 116; Garrison, *Successful Strategies*, 154-58; Pfaffenberger, *Web Search Strategies*, 13-19.
42. Alfred and Emily Glossbrenner, *Search Engines for the World Wide Web*, 2d ed. (Berkeley, CA: Peachpit Press, 1999), xi, 3-4.
43. Glossbrenner, *Search Engines*, 5-6, 33-46.
44. Steve Lawrence and C. Lee Giles, "Availability of Information on the Web," *Nature*, 8 July 1999, 107-110; Larry Williams, "Search Engines Not Keeping Up with the Internet," *The Miami Herald*, 297, 8 July 1999, sec. A, p. 15.
45. Lynch, "Without a Rulebook," 42.
46. For example, see Ian E. Anderson, ed., *Editor & Publisher International Year Book 1998* (NY: Editor & Publisher, 1998).
47. Additional analysis of these roles and job categories has been reported in another study. See Bruce Garrison, "Journalists' Newsroom Roles and Their World Wide Web Search Habits," (paper presented at the annual meeting of AEJMC, Phoenix, August 2000). An earlier version was presented to the Southeast Colloquium, Newspaper Division, AEJMC, Chapel Hill, NC, March 2000.
48. Charles L. Martin, "The Impact of Topic Interest on Mail Survey Response Behaviour," *Journal of the Market Research Society* 36 (October 1994): 327-38; see also Ronald Czaja and Johnny Blair, *Designing Surveys: A Guide to Decisions and Procedures* (Thousand Oaks, CA: Pine Forge Press, 1996), 35-36.
49. Garrison, "Diffusion of a New Technology"; Garrison, *Computer-Assisted Reporting*; Garrison, *Successful Strategies*; Reddick and King, *The Online Journalist*.

PERCEPTIONS OF INTERNET INFORMATION CREDIBILITY

By Andrew J. Flanagin and Miriam J. Metzger



People increasingly rely on Internet and web-based information despite evidence that it is potentially inaccurate and biased. Therefore, this study sought to assess people's perceptions of the credibility of various categories of Internet information compared to similar information provided by other media. The 1,041 respondents also were asked about whether they verified Internet information. Overall, respondents reported they considered Internet information to be as credible as that obtained from television, radio, and magazines, but not as credible as newspaper information. Credibility among the types of information sought, such as news and entertainment, varied across media channels. Respondents said they rarely verified web-based information, although this too varied by the type of information sought. Levels of experience and how respondents perceived the credibility of information were related to whether they verified information. This study explores the social relevance of the findings and discusses them in terms of theoretical knowledge of advanced communication technologies.

The Internet has quickly become a viable technology used by an estimated 130 million people¹ in 171 countries² for a variety of communication and information-sharing tasks. Internet technologies have been applied to education,³ have stimulated electronic commerce,⁴ have been used to develop online communities and cultures,⁵ and have helped organizations develop communication via intranets.⁶

However, although information obtained via the Internet is abundant, easily available, and often comprehensive, it can differ from information obtained via other media sources in several respects. For instance, web-based information typically undergoes an editorial process prior to "publication" that may differ greatly from that of other media content. In addition, people are still experimenting with strategies to make sense of web-based information. Among the potential results of this relatively unchecked information flow and individuals' nascent sensemaking strategies is the possibility that information is intentionally or unintentionally inaccurate, biased, or misleading. Indeed, the growth of the Internet has seen an attendant growth of online fraud and misinformation.⁷

Misinformation, of course, is not new with the Internet. However, many of the existing institutional, structural, and cognitive methods people employ to discern the relative value or accuracy of information (e.g., estab-

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lished reputations, genres, or personal experience) may not be as effective with the Internet, at least at this time.⁸ In addition, with the advent of the Internet as a widely used information source, new issues of information verity have arisen that are specific to this delivery tool. This research, then, addresses people's perceived credibility of Internet information in relation to other mass communications media, the extent to which Internet users verify the information they receive, and the differences along these dimensions between Internet users with various levels of experience and skill. In addition, because people identify different *types* of information, this important distinction is also considered.

Internet-Based Information Retrieval and Evaluation

Use of the Internet for Information Retrieval. Research demonstrates that people rely heavily on the Internet for gathering information.⁹ Flanagan and Metzger¹⁰ found that the Internet was used "to get information" more than were books, magazines, television, newspapers, the telephone, electronic mail, or face-to-face communication. In addition, information seeking was by far the strongest motive for Internet use in that study. Currently, one can research stocks; find information about myriad organizations and special interest groups; search the yellow pages; and purchase books, airline tickets, automobiles, and even homes using the Internet. The trend is clearly toward the availability of more, and more diverse, information available via the Internet and, seemingly, toward greater reliance on that information as well.¹¹

However, the Internet differs from other technologies used for information retrieval in key ways that can affect its reliability, credibility, and verity as an information source. The Internet's structure, designed specifically *not* to be centrally controlled or vulnerable to the failure of any specific part, spawned the popular phrase "information wants to be free," to describe the free-flow of information that takes place over the Internet. Indeed, on the Internet anyone can be an author. As Beacham puts it, "the Internet represents the real information revolution...one that removes the governmental and corporate filters that have so long been in place with traditional mass media."¹²

This information freedom, however, also introduces an increased potential for error or exploitation. Whereas newspapers, books, magazines, and television all undergo certain levels of factual verification, analysis of content, and editorial review, by and large Internet information is subject to no such scrutiny. Internet sites that parallel their print counterparts, such as major newspapers and periodicals, invoke the same editorial processes as their print forms, but they constitute only a small portion of the information available over the Internet. More common is less formal information generated by special interest groups, individuals, and organizations—the level of editorial review for which is not explicit. As Gilster warns, "One of the challenges of Internet publishing is that it turns our conventional expectations, built upon years of experience with newspapers and magazines, on their head. We can no longer assume that the appearance of a publication is necessarily relevant to the quality of its information."¹³ As a result, editorial functions that were formerly the responsibility of the information producer or publisher now fall upon the shoulders of the media consumer.¹⁴

Strategies for Information Evaluation. One way in which media consumers live up to this responsibility and learn to distinguish among various sources of information is through experience using them. Over time, people become familiar with the information delivery styles of different media, the ways in which the media are used, and the attendant trust that

should be granted to various sources. In short, media users develop levels of media literacy, either through experience using media or by socialization into the norms of media use.¹⁵

Similarly, users often make sense of traditional communication and information sources by identifying the genre of the medium and then applying embedded knowledge appropriate to that genre in order to interpret information accordingly. For example, it is likely that newspaper readers make distinctions between the *New York Times* and *New York Post* in terms of their expectations about credibility, sensationalism, and objectivity. These distinctions are based on the genre of the source (e.g., mainstream vs. sensationalist media), which, in turn, guides readers' interpretations of content.

Finally, the editorial processes that confirm the information delivered through mass media sources provide a certain level of security to information consumers. The use of multiple sources for obtaining information, relatively objective standards of reporting, and fact-checking procedures all help to ensure a degree of information reliability. Users rely on these checks and balances at the editorial level to help them evaluate information effectively.

However, the relative newness of the Internet, the lack of clearly established genres, and the scarcity of explicit editorial policies for most web sites suggest that information obtained via the Internet might be dubious or difficult to appraise. Users who are fairly new to the Internet may have an especially difficult time evaluating Internet information accurately. In addition, the rapidly changing nature of web-based information makes the application of specific genre rules difficult for users, at least in the early stages of the Internet's development. Finally, editorial policies in regard to the majority of information on the Internet are nonexistent, unknown, or ambiguous. Only with web sites that parallel their more conventional counterparts are editorial policies firmly established (e.g., the *New York Times* online) and found to positively affect users' perceptions of information credibility.¹⁶ As a result, developing Internet literacy can be problematic. The fact that the Internet is changing quickly, resembles multiple media, and contains many types of information further compounds the problem. Thus, becoming a literate Internet user requires locating, identifying, and striking a complex, moving target.

Unfortunately, few studies have examined people's assessment of the credibility of information found on the Internet.¹⁷ Furthermore, even among existing research, evidence is mixed and, as Gilster asks, "On a network where the basic tools of publishing are in many cases free, is it too easy to produce deceptively sophisticated content? Are there dangers in misleading people into thinking they're dealing with experts when they might be dealing with cranks? These are troubling questions that deserve better answers than they have received."¹⁸ Indeed, existing studies have yet to consider a host of factors that could serve to advance knowledge of people's perceptions of Internet information credibility, particularly in relation to other technologies and across multiple types of information.

New Factors in Internet Information Credibility

Research on the credibility of traditional versus Internet information sources has not produced consistent findings. Looking at the delivery of political messages via the Internet versus more traditional channels, Johnson and Kaye¹⁹ found that Internet users judged online political information sources as more credible than their traditional media counterparts. However, credibility ratings were low across all media and they did not include nonusers in their sample. In another recent survey of Internet users, Internet

news sources were not judged as significantly more credible than traditional sources.²⁰ Findings indicated that there was only a slight tendency for people to believe that more accurate information could be found online than in the daily newspaper or on television news. Contrary to these results, however, Mashek²¹ found that traditional media sources were rated by users as *more* fair and unbiased than their Internet equivalents for political information. Thus, previous studies of online news and political information do not demonstrate clear patterns of credibility assessment.

In order to achieve a more accurate view of the perceived credibility of Internet information, researchers need to expand the range of phenomena studied. Important issues to consider include researching a wide range of media simultaneously, explicitly examining the information verification procedures that users invoke, and considering multiple types of information.

Multiple Media. Research that periodically reassesses the usage of multiple media after the advent of new technologies is valuable in uncovering trends in media use at their outset and in prompting questions about the ongoing nature of technology use.²² For example, bi-annual surveys by the Roper Organization have tracked the relative credibility of several sources of news information since the 1950s. These studies have found a correspondence between the public's reliance on television news over other sources of news (such as the newspaper, radio, and newsmagazines) and increases in credibility ratings of television as a media source.²³ So, whereas newspapers were once thought to be the most credible source of news information, since the early 1960s television has been perceived as the most believable medium.²⁴

With the coexistence of traditional media such as magazines and newspapers with more advanced, electronic media such as television, radio, and the Internet, perceptions of media and usage habits may be evolving.²⁵ As Johnson and Kaye²⁶ note, the use of the web as an information source should be evaluated within the contemporary media environment that includes more conventional options for information-seeking. Hence, the first research question of this study is:

RQ1: What is the relative perceived credibility of modern mass communications media, including television, newspapers, the Internet, radio, and magazines?

Information Verification. Methods of verifying information obtained through newspapers, magazines, and television are well established, relatively clear, and socially derived and spread. Validation is often achieved by referring to sources with credible reputations, seeking the advice of trusted others, and by relying on personal experience to determine the characteristics of trustworthy sources. However, with information obtained over the Internet, these same strategies are not always effective or available, although they may be more necessary.²⁷ As a response to this need, guidelines for evaluating online information are rapidly appearing from such agencies as the American Library Association,²⁸ the National Institute for Literacy,²⁹ and several colleges and universities around the world.³⁰ Regardless of whether or not users perceive information delivered via the Internet to be credible, efforts to validate that information are important predictors of trust and ongoing usage behavior as well as guides for the formation of appropriate Internet policy. To better understand users' verification behaviors, the following research question is proposed:

RQ2: To what extent do users of the Internet verify the information they receive through this medium?

Information Type. Although Flanagan and Metzger³¹ found that people use the Internet more than other media sources to get information, they did not distinguish among the many *types* of information available. Past research on the credibility of Internet information has also been narrowly focused in this respect. Studies of online information credibility have concentrated primarily on news or political information obtained by users, to the exclusion of other information types.³²

In fact, Internet users are pursuing more and more non-news information, increasingly seeking, for example, entertainment and financial information. The Pew Research Center's poll,³³ for instance, found that during the last three years the percentage of Internet users who get entertainment, financial, and news information has increased substantially (up 29 percent, 23 percent, and 16 percent, respectively). The many different types of information available, and the shift toward obtaining non-news information via the Internet, suggest that information *type* may be an important factor in the assessment of Internet information credibility. Given differences between information types, it is likely that users assess credibility differently for commercial, entertainment, news, and reference (factual, non-news) information. Decades of research on the message learning and cognitive approaches to persuasion, for instance, show that sources with persuasive intent are perceived as less trustworthy,³⁴ suggesting that commercial information may be viewed as less credible than other types. Thus, the following research question:

RQ3: Does the perceived credibility of media vary depending on the type of information sought?

Gunther³⁵ argues that media credibility is less a result of audience responses to media institutions and personalities and more a result of audience responses to specific content.³⁶ Specifically, Gunther finds that greater involvement with media content, characterized by information considered more personally relevant and consequential, elicits a higher degree of skepticism than less involving content, at least for news information. Using social judgment theory³⁷ and the elaboration likelihood model of persuasion,³⁸ Gunther shows that greater involvement with the message results in, first, a wider latitude of rejection and, as a result, more cognitive elaboration of the message since greater personal concern motivates people to "seek correct information and opinions."³⁹

Furthermore, some information, if inaccurate, is more detrimental to the user than other inaccurate information and is, therefore, more involving. For example, getting misinformation on stocks or medical advice online may have more serious personal consequences than inaccurate entertainment information. Therefore, individuals may be motivated to check the verity of online commercial, news, or reference information more carefully than online entertainment information since these types of information are likely to be more personally consequential. Thus, the fourth research question is:

RQ4: Do users of the Internet apply different levels of verification to the information they receive, according to the type of information sought?

Studies of media credibility show that as usage of a particular medium increases, so do credibility ratings of that medium. An example already discussed is the crossover in credibility ratings between newspapers and television as the diffusion of television reached 90 percent saturation of the U.S. market in the 1960s.⁴⁰ Other studies that have examined the association between usage of or reliance on a medium and perceptions of its credibility typically find a positive relationship as well.⁴¹ The Pew Research Center's⁴² recent survey of 1,993 Internet users found that higher consumption of online news resulted in higher accuracy ratings of Internet news outlets. In addition, a significant difference between Internet users and nonusers in judgments of the accuracy of online news information was found. Although all of these studies deal with news information exclusively, the general implication is clear: people trust information sources with which they are familiar. Therefore, our expectation in this study is that across all types of information:

H1: Individuals' experience with the Internet will be positively related to perceptions of its credibility as a source of information.

In addition, the Pew Research Center⁴³ found that Internet users put more value on the accuracy of online news information *over other sources* of news than nonusers did. They write, "almost half (49%) of web users say that Internet news is more accurate than news found in traditional print and broadcast outlets; [whereas] only 28% of non-online users agree."⁴⁴ In other words, credibility ratings of Internet news were enhanced among users of that medium over more traditional information channels. This suggests that there should be an interaction between experience and medium on perceptions of credibility such that:

H2: Internet users with greater experience will perceive it to be a more credible source of information, in relation to conventional media such as the television, newspapers, radio, and magazines, than will less experienced users.

There is also evidence that regular users, or users who have more experience with a medium, apply a higher level of scrutiny to the information they obtain from that medium. For example, in a study of people's understanding and attention to source attributions in news stories, Culbertson and Somerick⁴⁵ found that people with a "print orientation" (i.e., greater use of, and preference for, print news sources over other media) noticed sources of quotes in stories more than people who were not regular newspaper or newsmagazine readers. Furthermore, respondents used source information in their evaluations of the news stories. Culbertson and Somerick concluded that dependence on a news medium can affect the level of cognitive processing of news stories, such that people become more careful and critical evaluators of the information the more they use the medium.

In a study of users' attentiveness to sources of online news stories, Sundar⁴⁶ similarly found that users noticed quotes and actively used them in judging story quality and credibility. Although he did not correlate attentiveness to news sources and use of online news information, Sundar proposed that: "Just as Culbertson and Somerick found that those who preferred print

media over other media showed greater attentiveness to sources in print news stories, future research with online news may discover an 'online-orientation' in some subjects and respondents that predisposes them to factor source attributes into their perceptions of incoming news stimuli."⁴⁷

Although the present study is not concerned with attention to sources in online news stories per se, a variant of this type of "sourcing" behavior is a key part of the process of verifying Internet information. For example, identifying the author or organization who posted the information to the web, evaluating the author's goals and qualifications, or checking to see when the information was last updated are commonly recommended strategies for evaluating the quality of web-based information.⁴⁸ Based on Culbertson and Somerick's⁴⁹ findings that heavy users of a medium pay more attention to detail regarding the information found, and on Sundar's⁵⁰ proposition that experienced Internet users will be more attentive to source information than novice users, the third hypothesis of this study is:

H3: Individuals' experience with the Internet will be positively related to the degree of verification of the information received over the medium.

Method

Participants and Procedure. Data for this study were collected in late 1998 and early 1999 from respondents residing primarily on the west coast of the United States (266 unique home zip codes were reported). A total of 1,041 surveys were completed by undergraduate university students recruited from introductory and advanced communication courses ($N = 718$ or 69% of the sample) and a convenience sample of non-college-age respondents recruited using a "snowball" technique, with the aid of research assistants ($N = 323$ or 31% of the sample). Undergraduate participants received extra course credit as an incentive for completing the survey, while other participants received no incentives for their participation. All respondents were ensured that their responses would be anonymous.

Despite rapid changes in user profiles, compared to the typical U.S. citizen, contemporary Internet users are young (80% are under age 50), wealthy, and well-educated (39% have completed college), with the greatest proportion of expert users in their early- to mid-twenties.⁵¹ The respondents in this study were thus relatively representative of the typical Internet user, although not of wider demographic profiles of U.S. citizens, with a mean age of 23.97 years ($SD = 9.63$), a mean of 14.43 years of education ($SD = 1.65$), and annual incomes between \$50,000 and \$60,000 per year (parents' incomes were reported if respondents were still claimed as a dependent).

The survey was presented as a study of "information seeking" and took most respondents about fifteen minutes to complete. In order to guard against possible respondent fatigue, two different versions of the survey that varied the order of questions were administered randomly. No order effects were found.

Measures

Media credibility. The measurement of media credibility has been debated over the last five decades and research has shown that the way in which the concept is operationalized can make a difference in credibility ratings.⁵² The most consistent dimension of media credibility is believability, but accuracy, trustworthiness, bias, and completeness of information are other dimensions commonly used by researchers.⁵³ Therefore, in this study

media credibility was operationalized as a multidimensional concept, consisting of believability, accuracy, trustworthiness, bias, and completeness. For each of five media channels (television, newspapers, magazines, radio, and the Internet), respondents were asked to rate the degree that they found information on the medium to be believable, accurate, trustworthy, biased, and complete on 7-point scales ranging from 1 = "not at all" to 7 = "extremely" believable, accurate, etc. Bias scores were reverse-coded so that higher scores on all dimensions indicated greater perceptions of media credibility.

Verification of Internet Information. Survey items used to assess the degree to which respondents verify the various types of information they obtain from the Internet were derived from sources that provide guidelines for evaluating the quality of online information. Five dimensions of verification strategies emerged from the literature: accuracy, authority, objectivity, currency, and coverage.⁵⁴

Based on these dimensions, nine items were used to assess the degree to which respondents verified the various types of information they retrieved from the web. On a 5-point scale (where 1 = "never," 2 = "rarely," 3 = "occasionally," 4 = "often," and 5 = "all the time"), respondents were asked to indicate the degree that they check to see (a) who the author of the web site is and (b) whether contact information for that person or organization is provided on the web site; (c) verify the author's qualifications or credentials; (d) consider the author's goals/objectives for posting information online; (e) check to see if information is current; (f) seek out other sources to validate information they find online; (g) look for an official "stamp of approval" or a recommendation from someone they know; (h) consider whether the information represented is opinion or fact; and (i) check to see that the information is complete and comprehensive.

Type of Information and Media. Because perceived credibility and verification strategies may vary depending upon the type of information sought and retrieved, credibility and verification of four types of information were assessed: (1) news or current events information, (2) entertainment information, (3) reference or factual information, and (4) commercial or product information. Based on a pretest of the instrument, short descriptions and examples were added to aid respondents' understanding of what was meant for each type of information.⁵⁵

Based on past research, current usage, and the availability of the four information types included in this study from these media channels, five media channels were selected for this study: the Internet/WWW, newspapers, television, magazines, and radio.

Internet Experience and Demographics. Internet experience was assessed with five items: Internet/WWW use, experience, expertise, familiarity, and access. On a 7-point scale, respondents were asked to assess how often they use the Internet where 1 = "I never use the Internet/WWW" to 7 = "I very often use the Internet/WWW"; their experience using the Internet where 1 = "no experience" and 7 = "a great deal of experience"; their level of expertise ranging from 1 = "I am not at all expert" to 7 = "I am completely expert"; their level of familiarity with the variety and amount of information available on the Internet/WWW where 1 = "not at all familiar" and 7 = "extremely familiar"; and their level of Internet access where 1 = "It is extremely difficult for me to access the Internet/WWW" to 7 = "It is extremely easy for me to access the Internet/WWW." In addition to the credibility and verification measures, basic demographic data were also collected, including respondents' age, gender, income, home zip code, and number of years of education.

Analysis. In order to guard against the use of a sample that consisted of two relatively identifiable groups (i.e., undergraduate and nonstudent subsamples), all statistical tests were performed on weighted data that equalized the effects of the different samples. RQ1 and RQ3 were examined by a within-subjects 4 (information type) X 5 (medium) repeated measures ANOVA. After ordering means from highest to lowest for each test, Helmert and Difference (reverse Helmert) contrasts were used as follow-up tests of significance. RQ2 was analyzed by computing respondents' mean level of verification of Internet/WWW information. RQ4 was examined with a repeated measures one-way ANOVA, with Difference contrast follow-up tests.

H1 was tested by the Pearson product-moment correlation between Internet experience and perceived credibility of the Internet. H2 was tested by the Pearson product-moment correlation between Internet experience and the relative credibility of the Internet as compared to the credibility of other media (television, newspapers, radio, and magazines). The relative credibility of the Internet was derived by subtracting the mean credibility rating of the combination of television, newspapers, radio, and magazines from the perceived credibility score for the Internet. In this manner, higher scores indicate greater assessment of the Internet's credibility in regard to the average credibility of all other media combined. H3 was tested by the Pearson product-moment correlation between Internet experience and the degree of verification of Internet information. Finally, because current Internet users tend to be young and well-educated, and these factors could affect the proposed hypotheses, respondents' age and education level were controlled for in these analyses.

Results

Measurement Results. The multiple items composing the variable *Internet experience* (Internet use, experience, expertise, familiarity, and access) were subjected to a principal components factor analysis, using varimax rotation, in order to assess the dimensionality of the items. A single component was extracted, explaining 73% of the variance. Cronbach's alpha was computed on the resultant factor in order to assess the scale reliability, which was found to be quite good ($\alpha = .91$).

In similar fashion, principal components factor analyses were performed on the nine items constituting the *Internet verification* scale, for each of the four information types. In all cases, a single component was extracted, explaining from 54% to 62% of the variance. Cronbach's alpha was computed on each resultant factor in order to assess scale reliabilities. Alpha reliabilities were strong in each case (news information, $\alpha = .90$; entertainment information, $\alpha = .89$; commercial information, $\alpha = .91$; reference information, $\alpha = .90$) and the overall mean scale reliability for Internet information verification, regardless of information type, was high as well ($\alpha = .91$).

Finally, scale reliabilities were derived for the perceived *credibility* of each medium, across all types of information. Each medium's credibility scale reliability was derived from the mean of the calculated scale reliabilities across all information types. For example, Cronbach's alpha for Internet information credibility ($\alpha = .78$) was derived from the mean of the alpha reliabilities for Internet information credibility for news information ($\alpha = .80$), reference information ($\alpha = .82$), entertainment information ($\alpha = .78$), and commercial information ($\alpha = .72$). Cronbach's alpha was similarly calculated for television information credibility ($\alpha = .78$), newspaper information cred-

ibility ($\alpha = .80$), magazine information credibility ($\alpha = .80$), and radio information credibility ($\alpha = .77$).

Primary Results. The goals of the first and third research questions were to determine if credibility ratings differ as a function of medium (RQ1) and information type (RQ3). Table 1 shows the mean credibility ratings by medium and information type and Table 2 shows the results of the significance tests for these research questions.⁵⁶ Given the large sample size, almost all tests reached statistical significance. Consequently, we decided to use a more conservative standard to determine whether the differences observed between credibility means were truly meaningful. Specifically, instead of p -values as an indicator of significant differences between credibility rating means, we selected the measure of the variance explained, η^2 , as the standard to demonstrate meaningful differences.

In order to determine what constitutes a meaningful amount of variance explained, we examined the data and concluded that only when the independent variable(s) explained at least 7% of the variance in the dependent variable was this an *acceptably* meaningful difference. Although somewhat arbitrary, our decision was guided by the facts that (a) the findings were more interpretable using this criterion as opposed to a less conservative (e.g., 5%) or more conservative (e.g., 10%) standard, (b) there appeared to be somewhat of a natural break in the η^2 values around this threshold, (c) there were few η^2 values of .05 and .06 and, of those, only one (the interaction between medium and information type) seemed reasonable to follow up, given the aim of the study, and (d) this standard appears to be reasonably rigorous.

RQ1 sought to determine the relative credibility of five media channels: the Internet/WWW, magazines, newspapers, radio, and television. As seen in Table 2, the omnibus test revealed a main effect for medium ($F = 114.12$, $df = 4$, 2428 , $p < .001$, $\eta^2 = .16$). Helmert contrast tests revealed that newspapers were rated significantly higher in credibility than the other media, which were not different from one another along this dimension (see Table 1 "Medium Overall" for a summary of the mean value differences or Table 2, "Medium Follow-up Tests" for the contrasts).

RQ3 assessed whether credibility ratings depended on the type of information sought, irrespective of medium. Again there was a main effect for information type ($F = 140.69$, $df = 3$, 1821 , $p < .001$, $\eta^2 = .19$), and Difference contrasts revealed that news, reference, and entertainment information were perceived to be significantly more credible than commercial information (see Table 1 "Information Type Overall" for a summary of the mean value differences or Table 2, "Information Type Follow-up Tests" for the contrasts).

As already mentioned, the overall medium by information type interaction effect was significant but small ($F = 34.68$, $df = 12$, 7284 , $p < .001$, $\eta^2 = .05$). Because the interaction might reveal important differences within medium and information types, and because this is a primary emphasis of the research reported here, follow-up tests were performed. Within each information type, there were differences in credibility ratings across the five media (see Table 2, "Medium Within Information Type Omnibus Tests"). Helmert contrasts revealed that a common pattern emerged across all types of information: newspapers were rated as significantly more credible than all other media, whereas the other media were perceived as equally credible (for a summary of these results see the rows of Table 1 or Table 2, "Medium Within Information Type Follow-up Tests").

TABLE 1
Mean Credibility Ratings by Medium and Information Type
($N = 1,041$)

Information Type	Medium					Information Type Overall
	Internet/WWW	Magazines	Newspapers	Radio	Television	
News	4.23 ^w _{ab}	4.13 ^w _c	4.89 _d	4.24 ^w _e	4.36 ^w _f	4.37 _n
Reference	4.35 ^x _a	4.16 ^x _c	4.76 _d	4.09 ^x _e	4.09 ^x _g	4.29 _n
Entertainment	4.04 ^y _b	4.08 ^y _c	4.43	4.01 ^y _e	4.10 ^y _g	4.13 _n
Commercial	3.77 ^z	3.71 ^z	4.01	3.52 ^z	3.60 ^z	3.73
Medium Overall	4.09 ^m	4.02 ^m	4.52	3.97 ^m	4.04 ^m	

Note: Column means with common *subscripts* indicate that means are *not* significantly different from one another within that medium. Row means with common *subscripts* indicate that means are *not* significantly different from one another within that information type. Marginal means for medium overall with common superscripts indicate that means are *not* significantly different from one another. Marginal means for information type overall with common subscripts indicate that means are *not* significantly different from one another.

There were also differences in credibility ratings across the various types of information within each medium (see Table 2, "Information Type Within Medium Omnibus Tests"). Difference contrasts showed that on the Internet/WWW, reference, news, and entertainment information were perceived as more credible than commercial information. Furthermore, reference information was perceived to be more credible than entertainment information. For magazines and radio a common pattern emerged: reference, news, and entertainment information were perceived as equally credible but significantly more credible than commercial information. For newspapers, the pattern was slightly more complex. News and reference information were rated equally credible but significantly more credible than entertainment information and all of these information types were viewed as more credible than commercial information that users obtained through newspapers. Finally, news information obtained on television was perceived as more credible than reference and commercial information; reference information was perceived to be more credible than commercial information; and there was not a significant difference between people's perceptions of reference and entertainment information obtained via television. For summaries of all of these results see the columns of Table 1, or Table 2: "Information Type Within Medium Follow-up Tests."

RQ2 asked about the degree to which people verify the information they receive over the Internet. To answer this question, a mean verification score was computed for all information types combined ($M = 2.60$, $SD = .78$), indicating that respondents in our sample verify web-based information only "rarely" to "occasionally" (see Table 3). Mean verification scores for each

TABLE 2
Significance Tests for Credibility Research Questions

Test	F	df	p	η^2
Medium Main Effect	114.12	4, 2428	.000	.16*
Medium Follow-up Tests				
NP = IW, TV, MG, RA	144.27	1, 607	.000	.19*
NP, IW = TV	125.34	1, 607	.000	.17*
NP, IW, TV = MG	65.87	1, 607	.000	.10*
NP, IW, TV, MG = RA	109.50	1, 607	.000	.15*
IW = RA	18.08	1, 607	.000	.03
Information Type Main Effect	140.69	3, 1821	.000	.19*
Information Type Follow-up Tests				
N = R	8.97	1, 607	.003	.02
N, R = E	38.65	1, 607	.000	.06
N, R, E = C	359.00	1, 607	.000	.37*
E = C	133.20	1, 610	.000	.18*
R = E	19.33	1, 609	.000	.03
Medium X Information Type Interaction Effect	34.68	12, 7284	.000	.05
Medium Within Information Type Omnibus Tests				
News	119.28	4, 2428	.000	.16*
Reference	101.51	4, 2428	.000	.14*
Entertainment	51.08	4, 2428	.000	.08*
Commercial	59.56	4, 2428	.000	.09*
Medium Within Information Type Follow-up Tests				
News:				
NP = TV, RA, IW, MG	474.64	1, 607	.000	.44*
TV = RA, IW, MG	22.53	1, 607	.000	.04
RA = IW, MG	3.10	1, 607	.079	.01
IW = MG	5.49	1, 607	.019	.01
TV = MG	32.82	1, 617	.000	.05
Reference:				
NP = IW, MG, RA, TV	407.21	1, 607	.000	.40*
IW = TV	31.40	1, 609	.000	.05
Entertainment:				
NP = TV, MG, IW, RA	208.57	1, 607	.000	.26*
TV = RA	7.55	1, 619	.006	.01
Commercial:				
NP = IW, MG, TV, RA	210.51	1, 607	.000	.26*
IW = RA	40.78	1, 608	.000	.06

Table 2 cont. next page

Table 2 cont.

Test	F	df	p	η^2
Information Type Within Medium Omnibus Tests				
Internet/WWW	76.77	3, 1821	.000	.11*
Magazines	50.66	3, 1821	.000	.08*
Newspapers	187.33	3, 1821	.000	.24*
Radio	127.87	3, 1821	.000	.17*
Television	109.33	3, 1821	.000	.15*
Information Type Within Medium Follow-up Tests				
Internet/WWW:				
R = N	7.79	1, 607	.005	.01
R, N = E	47.52	1, 607	.000	.07*
R, N, E = C	176.46	1, 607	.000	.23*
N = E	23.29	1, 612	.000	.04
N = C	128.73	1, 610	.000	.17*
E = C	46.44	1, 610	.000	.07*
R = E	51.56	1, 609	.000	.08*
Magazines:				
R = N	0.14	1, 607	.713	.00
R, N = E	3.27	1, 607	.071	.01
R, N, E = C	150.71	1, 607	.000	.20*
R = E	2.97	1, 609	.085	.01
Newspapers:				
N = R	15.41	1, 607	.000	.03
N, R = E	111.52	1, 607	.000	.16*
N, R, E = C	387.97	1, 607	.000	.39*
R = E	67.02	1, 609	.000	.10*
E = C	99.09	1, 610	.000	.14*
Radio:				
N = R	20.68	1, 607	.000	.03
N, R = E	16.57	1, 607	.000	.03
N, R, E = C	368.96	1, 607	.000	.38*
N = E	33.00	1, 612	.000	.05
Television:				
N = E	37.26	1, 607	.000	.06
N, E = R	15.76	1, 607	.000	.03
N, E, R = C	282.78	1, 607	.000	.32*
N = R	48.37	1, 609	.000	.07*

Notes: Equal signs denote tests for equality of means; *p* values less than .05 indicate that the means are significantly different. Asterisks indicate that there is a meaningful difference between means, as indicated by the criterion $\eta^2 \geq .07$ as specified in the Results section. NP = newspapers; IW = Internet/WWW; TV = television; MG = magazines; RA = radio; N = news information; R = reference information; E = entertainment information; C = commercial information

TABLE 3
Mean Internet/WWW Verification Ratings,
across Information Type (N = 1,041)

Information Type	Mean Internet / WWW Verification	Standard Deviation
Reference	2.76 _a	.87
News	2.70 _{ab}	.86
Commercial	2.57 _{bc}	.95
Entertainment	2.39 _c	.81
Overall	2.60	.78

Note: Column means with common subscripts indicate that means are *not* significantly different from one another.

verification item ranged from a low of 2.10 ("Do you verify the author's qualifications or credentials?") to a high of 3.19 ("Do you check to see that the information is current?") across all types of information.

The aim of RQ4 was to determine if Internet users' verification behaviors vary as a function of information type. As indicated in Table 3, results show that, in our sample, they do (F = 59.40, df = 3, 1557, $p < .001$, $\eta^2 = .10$). Specifically, Difference contrasts revealed that reference information was verified to the same degree as news information, but more than either commercial or entertainment information. However, news and commercial information were not verified differently, nor were commercial and entertainment information. Finally, news information was verified more than entertainment information (see Tables 3 and 4 for means and results of all significance tests).

H1 proposed a positive relationship between Internet experience and perceived credibility of the Internet. The zero-order correlation between experience and perceived credibility was .18, $p < .001$, $r^2 = .03$ (N = 622). The second-order partial correlation, controlling for age and education, was .17, $p < .001$, $r^2 = .03$ (N = 602), indicating a significant, positive relationship between these variables. Thus, H1 was supported, although only a small amount of variance was explained.

H2 posited a positive relationship between Internet experience and the relative credibility of the Internet as compared to other media. The zero-order correlation between experience and relative Internet credibility was .08, $p = .057$ (N = 622). The second-order partial correlation, controlling for age and education, was .06, $p = .134$ (N = 602). H2 was not supported.

In H3, a positive relationship between Internet experience and the degree of verification of information obtained via the Internet was proposed. The zero-order correlation between experience and information verification was .28, $p < .001$, $r^2 = .08$ (N = 577). The second-order partial correlation, controlling for age and education, was .30, $p < .001$, $r^2 = .09$ (N = 556), indicating a significant, positive relationship. Thus, H3 was supported.

Discussion

Media Credibility. Except for newspapers, which were clearly rated highest in perceived credibility, credibility ratings did not vary as a function of medium. This finding was robust across information types: Among

TABLE 4
Significance Tests for Verification Research Questions

Test	F	df	p	η^2
Information Type Omnibus Test	59.40	3, 1557	.000	.10*
Information Type				
R = N	2.84	1, 519	.093	.00
R, N = C	44.88	1, 519	.000	.08*
R, N, C = E	146.33	1, 519	.000	.22*
N = C	22.27	1, 527	.000	.04
C = E	26.51	1, 528	.000	.05
R = C	42.49	1, 535	.000	.07*

Notes: Equal signs denote tests for equality of means; p values less than .05 indicate that the means are significantly different.

Asterisks indicate that there is a meaningful difference between means, as indicated by the criterion $\eta^2 \geq .07$ as specified in the Results section.

R = reference information; N = news information; C = commercial information; E = entertainment information

respondents, the perception that newspapers were more credible than all other media channels held true regardless of the type of information considered (news, reference, entertainment, or commercial). This finding suggests that, beyond newspapers, the medium is *not* the message, at least in terms of credibility perceptions.

This result is somewhat surprising. Past research on the credibility of news information typically finds that television is perceived to be more credible than newspapers.⁵⁷ Among the possible explanations for our finding could be an evolution in television programming over the past few decades (e.g., the intersection of entertainment and news programming, the potential for deception due to digital manipulation, and an emphasis on viewer interest over event importance) and a highly educated sample that might have a bias toward print media. Another alternative explanation for this finding is suggested by Newhagen and Nass⁵⁸ who argue that discrepancies in newspaper and television credibility ratings are a result of people using different levels of analysis when assessing credibility of these two media. Specifically, they argue that people determine newspaper credibility on the basis of their evaluation of the newspaper as an institution whereas television news credibility assessments are based on people's evaluations of the individuals presenting the information (i.e., reporters or anchorpersons). Indeed, it is plausible that the wording of the questions in this study may have prompted an institutional (versus individual) perception of all media, thereby influencing credibility ratings.

Findings also show that information obtained via the Internet is perceived to be as credible as that found through magazines, the radio, and television (irrespective of information type). Given the potential for misinformation on the Internet and user inexperience relative to more traditional media, this finding is somewhat alarming since it suggests that people are not taking an especially critical stance toward what is arguably the least critical medium (in terms of editorial review of content). So, although perhaps people *should* think of the Internet as less credible than other media, these

TABLE 5
Ranking of User Verification Strategies for Information Obtained via the Internet/WWW (N = 972)

Verification Strategy	Mean	SD
Check to see if the information is current	3.19	1.01
Check to see that the information is complete and comprehensive	2.98	.99
Consider whether the views represented are opinions or facts	2.91	1.01
Seek out other sources to validate the information	2.69	.95
Consider the author's goals/objectives for posting information online	2.67	.91
Check to see who the author of the web site is	2.38	.95
Look for an official "stamp of approval" or a recommendation from someone you know	2.32	.95
Check to see whether the contact information for that person or organization is provided on the site	2.20	.89
Verify the author's qualifications or credentials	2.10	.86

Note: Values are on a 5-point scale where 1 = "never," 2 = "rarely," 3 = "occasionally," 4 = "often," and 5 = "all the time"

respondents did not. In fact, looking within each of the four types of information included in this study, the Internet is ranked second only to newspapers in its perceived credibility for reference and commercial information.

A potential explanation for this finding is that respondents may judge credibility on the basis of content rather than medium. That is, if respondents think of news information on the Internet in terms of CNN's web site, for instance, they would be unlikely to report that it differs in credibility from CNN on television. However, there is some evidence that this type of interpretation was not in fact taking place in this study, at least to a wide extent. For example, because newspapers were rated as significantly *more* credible than the Internet for news information, it would appear that respondents were *not* simply comparing the *New York Times* online to the *New York Times* in print.

Absent data on the specific web sites that people visit, however, it is difficult to judge whether we are truly seeing a content or a medium effect. This highlights the topic of content versus medium effects and suggests that it is a complex and important issue that requires more direct scholarly attention than it has received to date. Accordingly, future research should examine Internet users' *reasons for* credibility perceptions, including site by site assessments, in order to pinpoint the specific features that inform users' opinions of credibility. Doing so would enable researchers to locate more accurately the features of the Internet that contribute to perceptions of its

credibility, how these differ from other media, and the ways in which they might bear on future credibility perceptions as the medium evolves.

The experience of Internet users affected these results to some extent. More experienced users were somewhat more likely to view the Internet as a credible source of information (H1) but did not find the Internet to be more credible as compared to other media (H2). Thus, consistent with past research that demonstrates a positive relationship between usage of a medium and ratings of its credibility,⁵⁹ respondents demonstrated that familiarity breeds trust when it comes to web-based information. This effect, however, did not seem to influence respondents' assessments of the credibility of other media channels. This suggests that one's perceptions of media credibility do not constitute a zero sum equation such that finding some media to be more credible reduces the perceived credibility of others.

Finally, results of this study show that news, reference, and entertainment information are all rated as more credible than commercial information. In fact, commercial information seems to be quite distinct in its low level of perceived credibility among respondents. This pattern of findings holds for the Internet as well and lends support to theories of persuasion, that predict known manipulative intent on the part of the source negatively impacts trustworthiness.

Verification of Internet Information. Respondents reported verifying the information they obtained via the Internet only "rarely" to "occasionally." Examination of the individual verification items provides a more complete picture of Internet users' verification behavior (see Table 5): People scored highest on those verification behaviors that are easy to perform and require their opinion (e.g., considering whether information is current and complete) and lowest on the verification behaviors that are difficult to perform and require their action (e.g., verifying the qualifications or credentials of the author). In view of the possibility for inaccurate, false, or misleading information on the web, this finding has implications both for web site consumers and for web site sponsors.

For web users, it appears that few are rigorously verifying the information obtained via the Internet (and this may be underestimated due to social desirability effects on reporting verification behaviors). Furthermore, the finding that user experience is positively related to the degree of verification employed (H3) shows that less experienced users are even less likely to verify information. Put another way, those who might benefit most from verifying online information (because they may lack experience that helps to discern valid from bogus material) are doing so the least. Consequently, as new users discover the Internet as a source of information, they may not invoke the tools that would help them achieve high Internet literacy. In essence, the "online orientation" suggested by past research,⁶⁰ and validated in this study, may be an important component of a savvy Internet user's repertoire.

In addition, verification behaviors varied depending on the type of information sought. Reference information was verified more rigorously than either commercial or entertainment information and news information was verified more stringently than entertainment information as well. However, reference and news information were verified equally rigorously. The same held true for news and commercial information and for commercial and entertainment information. Overall, these findings indicate that when misinformation is least damaging (e.g., entertainment) it is verified least rigorously, and information where accuracy may be more important (e.g., refer-

ence and news information) is verified significantly more. These results extend Gunther's⁶¹ finding, based on social judgment theory and the elaboration likelihood model, to show that more involving information not only affects attitudes toward the message (i.e., skepticism), but also affects behavior as well, in terms of verification of the message itself.

Internet users' experience also explains some verification behavior and raises intriguing questions. More experienced users are somewhat more likely to view the Internet as a credible source of information (H1) and tend to verify more often the information they obtain (H3). This leads to the question of the extent to which information credibility and information verification are directly related. To test this, a Pearson product-moment correlation between perceived credibility of the Internet and the degree of user verification of web-based information was performed. The second-order partial correlation between credibility and verification, controlling for age and education, was .08, $p < .05$, $r^2 = .01$ ($N = 690$), indicating a significant, positive relationship between these variables, although the variance explained was extremely low. Consequently, verification seems to lead to higher perceptions of credibility (this causal direction makes more sense than the reverse), although the relationship is not very well specified here and warrants further research.

Furthermore, as noted earlier, more experienced users did not find Internet information more credible relative to information obtained from other media (null results for H2). Together, the results of all of the hypotheses thus suggest that savvy users view the Internet as a credible source even as they recognize its limitations relative to other media and, accordingly, tend to verify the information they do glean from it more rigorously. Overall, this implies the value of attaining a more complete understanding of media channels and also suggests one of the novel features of the Internet, as compared to most other information delivery tools: The freedom to seek out and independently assess information on the web from a huge array of possibilities puts enormous control into users' hands. In turn, users assume a great deal of responsibility. To an extent, this type of control may also help to explain users' credibility assessments, since they have the power to easily avoid sites they deem to be lower in credibility and frequent those they view as credible. Thus, one indicator of users' credibility ratings that these data suggest is the capability on the Internet for users to selectively choose the information they attend to and to simply steer clear of what they wish to avoid.

Finally, for web site sponsors, the findings of this study suggest strategies whereby site sponsors might bolster their perceived credibility. Because credibility and verification are related, sponsors of web sites who wish to be viewed as credible may want to implement relatively easy-to-use verification tools. Considering the overall findings on the verification of Internet information by users, however, it should be noted that verification strategies and behaviors require a great deal more research in order to assess accurately the most effective strategies for web site users and authors.

Limitations and Directions for Future Research. There are a number of limitations of this study and, in view of its relatively novel concerns, several fruitful directions in which to proceed with future research. First and foremost, because the data for this study were obtained via a nonrandom, convenience sample, the limits to validity must be taken into consideration. Thus, although the data cannot be viewed as representative of the population (either of Internet users or of the wider population), they do offer insight into

respondents' behaviors that are the focus of this exploratory research (e.g., the perceptions of media relative to one another). Future research that endeavors to describe population distributions will add insight into our findings, particularly inasmuch as Internet users and nonusers may be compared across a variety of dimensions.

Another potential issue is the claim that Internet information is more prone to a preponderance of misinformation relative to other media. In other words, a premise of this study is that information available on the web is subject to less rigorous editorial review and, further, that it has greater potential than information found on other media to be either intentionally or accidentally inaccurate. Although there is mounting evidence for these claims,⁶² there also exist an increasing number of web sites that parallel other media and whose credibility is, as a result, well-established. Thus, the accuracy of this study's premise should be monitored as further research of these issues is undertaken.

Finally, this study represents an initial exploration of the important issue of people's perceptions of information credibility across contemporary media. There remains a great deal more research to be performed on Internet credibility and information verification. Among the specific areas of research prompted by this study are an examination of (a) the role of the specific source of information (e.g., personal versus institutional sources or different web site sponsors/authors) in perceptions of credibility, (b) information content versus medium differences, (c) a more complete explication of the verification process of web-based information in general, (d) the relation between perceived credibility and the use of various verification strategies and, importantly, (e) the further development of specific theoretical rationales to help explain users' perceptions of information credibility, their verification behaviors, and the relation between the two.

Conclusion

The value of this research is threefold. First, this study supplies an important, and as yet unconsidered, dimension to Internet research. To date, research on Internet information credibility has lagged behind research on Internet usage. Scholars have not considered media credibility issues across the spectrum of contemporary media, for multiple information types, and in consideration of users' strategies for information verification. This study is a step toward addressing these needs.

Second, evaluating Internet information credibility has significant social relevance and consequence. As Gilster poses: "When is a globe-spanning information network dangerous? When people make too many assumptions about what they find on it. For while the Internet offers myriad opportunities for learning, an unconsidered view of its contents can be misleading and deceptive."⁶³ This research is useful in evaluating the extent to which these worries are founded. Consequently, findings of this study are directly relevant to the assessment of such potential dangers and the formulation of appropriate Internet policies, both formal and informal.

Third, this study adds significantly to communication scholars' understanding of media credibility, to knowledge about advanced communication and information technologies, and to an assessment of individuals' perceptions and use of these technologies. Given the extent to which information is obtained today via communication technologies, such issues are particularly crucial to understand and to continue to examine as technologies and our use of them mutually evolve.

NOTES

1. Nielsen//NetRatings, *Hot Off the Net*, 2000. Available online at: <http://www.nielsenratings.com/>. Accessed: July 2000.
2. Robert H. Zakon, *Hobbes' Internet Timeline v 4.0*, 1999. Available online at: <http://info.isoc.org/guest/zakon/Internet/History/HIT.html>. Accessed: July 1999.
3. Richard H. Bee and Ebenge E. Usip, "Differing Attitudes of Economic Students About Web-Based Instruction," *College Student Journal* 32 (1998): 258-69; James V. Couch, "Using the Internet in Instruction: A Homepage for Statistics," *Psychological Reports* 81 (1997): 999-1003; Chris Couples and Timothy W. Luke, "Academic Infotecture: Course Design for Cyberschool," *Social Science Computer Review* 16 (1998): 136-43; Andrew J. Flanagin, "Theoretical and Pedagogical Issues in Computer-Mediated Instruction and Instruction: Lessons from the Use of a Collaborative Instructional Technology," *The Electronic Journal of Communication / La revue électronique de communication* 9 (1999). Available online at: <http://www.cios.org/www/ejmain.htm> (secure web site); Robert S. Gilliver, Bernard Randall, and Yang M. Pok, "Learning in Cyberspace: Shaping the Future," *Journal of Computer Assisted Learning* 14 (1998): 212-22; Andreas Schneider, "The Internet as an Extended Classroom," *Social Science Computer Review* 16 (1998): 53-57; Ebenge E. Usip and Richard H. Bee, "A Discriminant Analysis of Students' Perceptions of Web-Based Learning," *Social Science Computer Review* 16 (1998): 16-29.
4. Danna L. Hoffman, Thomas P. Novak, and Patrali Chatterjee, "Commercial Scenarios for the Web: Opportunities and Challenges," *Journal of Computer-Mediated Communication* 1, (3, 1996). Available online at: <http://www.ascusc.org/jcmc/vol1/issue3/hoffman.html>. Accessed: July 1999; John Nouwens and Harry Bouwman, "Living Apart Together in Electronic Commerce: The Use of Information and Communication Technology to Create Network Organizations," *Journal of Computer Assisted Learning* 1 (3, 1995). Available online at: <http://www.ascusc.org/jcmc/vol1/issue3/nouwens.html>. Accessed: July 1999.
5. Nancy Baym, "The Emergence of Community in Computer-Mediated Communication," in *Cybersociety: Computer-Mediated Communication and Community*, ed. Steven Jones (Thousand Oaks, CA: Sage, 1995), 138-63; Steven G. Jones, ed., *Cybersociety: Computer-Mediated Communication and Community* (Thousand Oaks, CA: Sage, 1995); Steven G. Jones, ed., *Virtual Culture: Identity and Communication in Cybersociety* (Thousand Oaks, CA: Sage, 1997); Margaret L. McLaughlin, Kerry K. Osborne, and Nicole B. Ellison, "Virtual Community in a Telepresence Environment," in *Virtual Culture: Identity and Communication in Cybersociety*, ed. Steven Jones (Thousand Oaks, CA: Sage, 1997), 146-68; Howard Rheingold, *The Virtual Community: Homesteading on the Electronic Frontier* (NY: Addison Wesley, 1993); Sherry Turkle, *Life on the Screen* (NY: Simon & Schuster, 1995); J. MacGregor Wise, *Exploring Technology and Social Space* (Thousand Oaks, CA: Sage, 1997).
6. Mellanie Hills, *Intranet Business Strategies* (NY: John Wiley and Sons, 1997).
7. Jeri Clausen, "A New Watchdog against Internet Fraud (Securities and Exchange Commission Office of Internet Enforcement Chief John Reed Stark)," *New York Times*, 3 August 1998, sec. C, p. 3; Peter Hernon, "Disinformation and Misinformation through the Internet: Findings of an Exploratory Study," *Government Information Quarterly* 12 (1995): 133-39; Mark Ward, "Surfing for the Suckers," *New Scientist* 156 (1997): 29.

Misinformation on the Internet is a serious problem, ranging from scam artists selling bogus products, to quacks dispensing dubious medical advice, to the strategic spreading of misinformation about a business competitor, to gossip and rumors posted online becoming the basis for actual news stories. Accordingly, the government has begun to set up watchdog agencies to deal with the problem of Internet misinformation. For example, the U.S. Securities and Exchange Commission recently established the Office of Internet Enforcement to fight online securities fraud (Clausen, "A New Watchdog against Internet Fraud [Securities and Exchange Commission Office of Internet Enforcement Chief John Reed Stark]"). and the Food and Drug Administration's Department of Drug Marketing, Advertising, and Communications is in the process of forming policy regarding marketing and advertising of prescription drugs and medical devices via the Internet (Mark A. Moberg, J. W. Wood, and H. L. Dorfman, "Surfing the Net in Shallow Waters: Product Liability Concerns and Advertising on the Internet," *Food and Drug Law Journal* 53 [1998]: 213-24; Vern Realto, "Prescription Meds Meet the Web," *Pharmaceutical Executive* 18, [11, 1998]: 6-16.). In addition, other groups have also called for methods to stem the flow of fraudulent information available on the web (Paul Gilster, *Digital Literacy* [NY: John Wiley & Sons, 1997]; S. Shyam Sundar, "Effect of Source Attribution on Perceptions of Online News Stories," *Journalism & Mass Communication Quarterly* 75 [spring 1998]: 55-68; Steve Ulfelder, "Lies, Damn Lies and the Internet [Misinformation About Companies]," *Computerworld* 31 [1997]: 75-76; Ward, "Surfing for the Suckers.").

8. Embedded in this statement, of course, is one of the key challenges to scholars conducting Internet research: It is difficult for research to keep pace with a medium that is evolving so quickly. In effect, this is an exciting, daunting, and necessary task if we are to chart the course of the Internet's evolution. Important to the enterprise is to note the specific points at which snapshots of this evolution occur. The data collection in this study, as noted in the Methods section, ended in early 1999.

9. Adrienne W. Fawcett, "Online Users Go for Facts over Fun," *Advertising Age*, 14 October 1996, 46; Andrew J. Flanagin and Miriam J. Metzger, "Internet Use in the Contemporary Media Environment," *Human Communication Research* 27 (1, 2000): 153-81; Pew Research Center for the People and the Press, *The Internet News Audience Goes Ordinary*, 14 January 1999. Available online at: <http://www.people-press.org/tech98sum.htm>. Accessed: July 1999.

10. Flanagin and Metzger, "Internet Use in the Contemporary Media Environment."

11. Pew Research Center for the People and the Press, *The Internet News Audience Goes Ordinary*.

12. Frank Beacham, "Questioning Technology: Tools for the Revolution," *Media Culture Review* 4 (1995): 6, 18.

13. Gilster, *Digital Literacy*, 90.

14. Gilster, *Digital Literacy*; Lawrence E. Scheuermann and Harold P. Langford, "Perceptions of Internet Abuse, Liability, and Fair Use," *Perceptual and Motor Skills* 85 (1997): 847-50.

15. Carlos E. Cortes, "Media Literacy: An Educational Basic for the Information Age," *Education and Urban Society* 24 (1992): 489-97; W. James Potter, *Media Literacy* (Thousand Oaks, CA: Sage, 1998).

The term "media literacy" has several meanings. For some, media literacy refers to a set of basic skills or knowledge; for example, the ability to

- read or to program a videocassette recorder. Extending this perspective to the newest area of media literacy—Internet literacy—it involves such things as the ability to find a particular web site by using a browser such as Netscape or Microsoft Explorer. Others (as we do here) use the term to refer to the ability to critically analyze and evaluate information from media sources. This view of media literacy moves beyond the possession of basic skills to involve higher-level processing of information and implies being selective about information, making informed judgments about content, and, in some cases, evaluating the impact of that information appropriately (for similar perspectives see David Bianculli, *Teletiteracy: Taking Television Seriously* [NY: Continuum, 1992]; Cortes, "Media Literacy: An Educational Basic for the Information Age"; Ibrahim M. Hefzallah, *Critical Viewing of Television: A Book for Parents and Teachers* [Lanham, MD: University Press of America, 1987]; Potter, *Media Literacy*).
16. Pew Research Center for the People and the Press, *The Internet News Audience Goes Ordinary*.
 17. Thomas J. Johnson and Barbara K. Kaye, "Cruising Is Believing? Comparing Internet and Traditional Sources on Media Credibility Measures," *Journalism & Mass Communication Quarterly* 75 (1998): 325-40; John W. Mashek, *Lethargy '96: How the Media Covered a Listless Campaign* [Arlington, VA: The Freedom Forum, 1997]; Pew Research Center for the People and the Press, *The Internet News Audience Goes Ordinary*.
 18. Gilster, *Digital Literacy*, 35.
 19. Johnson and Kaye, "Cruising Is Believing? Comparing Internet and Traditional Sources on Media Credibility Measures."
 20. Pew Research Center for the People and the Press, *The Internet News Audience Goes Ordinary*.
 21. Mashek, *Lethargy '96: How the Media Covered a Listless Campaign*.
 22. Flanagan and Metzger, "Internet Use in the Contemporary Media Environment"; Elizabeth M. Perse and John A. Courtwright, "Normative Images of Communication Media: Mass and Interpersonal Channels in the New Media Environment," *Human Communication Research* 19 (1993): 485-503.
 23. Roper Organization, *America's Watching: Public Attitudes toward Television* (NY: Roper Organization, 1991).
 24. See also Harvey K. Jacobson, "Mass Media Believability: A Study of Receiver Judgments," *Journalism Quarterly* 46 (1969): 20-28; Frank Newport and Lydia Saad, "A Matter of Trust," *American Journalism Review* (July/August 1998): 30-33.
 25. Flanagan and Metzger, "Internet Use in the Contemporary Media Environment."
 26. Johnson and Kaye, "Cruising Is Believing? Comparing Internet and Traditional Sources on Media Credibility Measures."
 27. Carol Caruso, "Before You Cite a Site," *Educational Leadership* 55 (1997): 24-25; Gilster, *Digital Literacy*; Ward, "Surfing for the Suckers."
 28. Jim Kapoun, *Teaching Undergrads Web Evaluation: A Guide for Library Instruction*, 1998. Available online at: wysiwyg:/14/http://www.ala.org/act1/undwebev.htm. Accessed: May 1999.
 29. David J. Rosen, *Driver Education for the Information Superhighway: How Adult Learners and Practitioners Use the Internet*, vol. 2, no. 2, *Series Title: Literacy Leader Fellowship Program Reports* (Washington, DC: National Institute for Literacy, February 1998).
 30. Alastair G. Smith (Maint.). *Evaluation of Information Sources*, September

ber 28 1998. Available online at: <http://www.vuw.ac.nz/~agsmith/evaln/evaln.htm>. Accessed: July 1999.

31. Flanagan and Metzger, "Internet Use in the Contemporary Media Environment."
32. Johnson and Kaye, "Cruising Is Believing? Comparing Internet and Traditional Sources on Media Credibility Measures"; Mashek, *Lethargy '96: How the Media Covered a Listless Campaign*; Pew Research Center for the People and the Press, *The Internet News Audience Goes Ordinary*.
33. Pew Research Center for the People and the Press, *The Internet News Audience Goes Ordinary*.
34. Richard E. Petty and John T. Cacioppo, *Attitudes and Persuasion: Classic and Contemporary Approaches* (Boulder, CO: Westview Press, 1981).
35. Albert C. Gunther, "Biased Press or Biased Public? Attitudes toward Media Coverage of Social Groups," *Public Opinion Quarterly* 56 (1992): 147-67.
36. See also Erica Weintraub Austin and Qingwen Dong, "Source v. Content Effects on Judgments of News Believability," *Journalism Quarterly* 71 (winter 1994): 973-83.
37. Carolyn W. Sherif, Muzafer Sherif, and Roger E. Nebergall, *Attitude and Attitude Change: The Social Judgment-Involvement Approach* (Philadelphia: W. B. Sanders, 1965).
38. Petty and Cacioppo, *Attitudes and Persuasion: Classic and Contemporary Approaches*.
39. Gunther, "Biased Press or Biased Public? Attitudes toward Media Coverage of Social Groups," 150.
40. Melvin L. DeFleur and Sandra J. Ball-Rokeach, *Theories of Mass Communication*, 5th ed. (NY: Longman, 1989); Roper Organization, *America's Watching: Public Attitudes toward Television*.
41. Richard F. Carter and Bradley S. Greenberg, "Newspapers or Television: Which Do You Believe?" *Journalism Quarterly* 42 (1965): 29-34; American Society of Newspaper Editors, "Newspaper Credibility: Building Reader Trust," study conducted by MORI Research Inc. (Minneapolis, MN; 1985); Bradley S. Greenberg, "Media Use and Believability: Some Multiple Correlates," *Journalism Quarterly* 43 (1966): 665-71, 732; Johnson and Kaye, "Cruising Is Believing? Comparing Internet and Traditional Sources on Media Credibility Measures"; Tony Kimmner and David Weaver, "Different Questions, Different Answers? Media Use and Credibility," *Journalism Quarterly* 64 (1987): 28-36; Eugene F. Shaw, "Media Credibility: Taking the Measure of a Measure," *Journalism Quarterly* 50 (1973): 306-11; Wayne Wanta and Yu-Wei Hu, "The Effects of Credibility, Reliance, and Exposure on Media Agenda-Setting: A Path Analysis Model," *Journalism Quarterly* 71 (spring 1994): 90-98; Bruce H. Westley and Werner J. Severin, "Some Correlates of Media Credibility," *Journalism Quarterly* 41 (1964): 325-35; David Charles Whitney, *The Media and the People: Soundings from Two Communities* (NY: Gannett Center for Media Studies, Columbia University, 1986).
42. Pew Research Center for the People and the Press, *The Internet News Audience Goes Ordinary*.
43. Pew Research Center for the People and the Press, *The Internet News Audience Goes Ordinary*.
44. Pew Research Center for the People and the Press, *The Internet News Audience Goes Ordinary*, 9.
45. Hugh M. Culbertson and Nancy Somerick, "Variables Affect How Persons View Unnamed News Sources," *Journalism Quarterly* 54 (1977): 58-69.

46. Sundar, "Effect of Source Attribution on Perceptions of Online News Stories."
47. Sundar, "Effect of Source Attribution on Perceptions of Online News Stories," 64.
48. Daniel J. Barrett, *NetResearch: Finding Information Online* (Sebastopol, CA: O'Reilly & Associates, 1997); Brandt D. Scott, "Evaluating Information on the Internet," *Computers in Libraries* 16 (1996): 44-46; Caruso, "Before You Cite a Site"; Gilster, *Digital Literacy*; Cheryl Harris, *An Internet Education: A Guide to Doing Research on the Internet* (Belmont, CA: Wadsworth, 1996); Debra Jones, *Exploring the Internet: Using Critical Thinking Skills* (NY: Neal-Schuman Publishers, 1998); Kapoun, *Teaching Undergrads Web Evaluation: A Guide for Library Instruction*; Rebecca B. Rubin, Alan M. Rubin, and Linda L. Peale, *Communication Research: Strategies and Sources*, 5th ed. (Belmont, CA: Wadsworth, 2000); Marsha Tate and Jan Alexander, "Teaching Critical Evaluation Skills for World Wide Web Resources," *Computers in Libraries* 16 (10, 1996): 49-52, 54-55; see also bibliographies in Jan E. Alexander and Marsha Tate, *Web Evaluation Techniques: Bibliography*, 1996-8. Available online at: <http://www.science.widener.edu/~withers/webstrbib.htm>. Accessed: July 1999; Virginia Montecino, *Guidelines for Critiquing Web Sites and Web Style Manuals*, October 1998. Available online at: <http://mason.gmu.edu/~montecin/webcritique.htm>. Accessed: July 1999; Smith, *Evaluation of Information Sources*.
49. Culbertson and Somerick, "Variables Affect How Persons View Unnamed News Sources."
50. Sundar, "Effect of Source Attribution on Perceptions of Online News Stories."
51. Georgia Tech Research Corporation, *GVU's WWW User Surveys*, 1997. Available online at: http://www.gvu.gatech.edu/user_surveys/survey-1997-10/. Accessed: July 1999; Pew Research Center for the People and the Press, *The Internet News Audience Goes Ordinary*.
52. Cecilie Gaziano and Kristin McGrath, "Measuring the Concept of Credibility," *Journalism Quarterly* 63 (1986): 451-62; Philip Meyer, "Defining and Measuring Credibility of Newspapers: Developing an Index," *Journalism Quarterly* 65 (1988): 567-74; John Newhagen and Clifford Nass, "Differential Criteria for Evaluating Credibility of Newspapers and TV News," *Journalism Quarterly* 66 (1989): 277-84; Rimmer and Weaver, "Different Questions, Different Answers? Media Use and Credibility"; Shaw, "Media Credibility: Taking the Measure of a Measure"; Mark Douglas West, "Validating a Scale for the Measurement of Credibility: A Covariance Structure Modeling Approach," *Journalism Quarterly* 71 (1994): 159-68.
53. Austin and Dong, "Source v. Content Effects on Judgments of News Believability"; Carter and Greenberg, "Newspapers or Television: Which Do You Believe?"; American Society of Newspaper Editors, "Newspaper Credibility: Building Reader Trust"; Cecilie Gaziano, "How Credible Is the Credibility Crisis?" *Journalism Quarterly* 65 (1988): 267-78; Gaziano and McGrath, "Measuring the Concept of Credibility"; Greenberg, "Media Use and Believability: Some Multiple Correlates"; Albert Gunther, "Attitude Extremity and Trust in Media," *Journalism Quarterly* 65 (1988): 279-87; Jacobson, "Mass Media Believability: A Study of Receiver Judgments"; Meyer, "Defining and Measuring Credibility of Newspapers: Developing an Index"; Ronald Mulder, "Media Credibility: A Use-Gratifications Approach," *Journalism Quarterly* 57 (1980): 474-77; Newhagen and Nass, "Differential Criteria for Evaluating Credibility of Newspapers and TV News"; Rimmer and Weaver, "Different

Questions, Different Answers? Media Use and Credibility"; Michael J. Robinson and Andrew Kohut, "Believability and the Press," *Public Opinion Quarterly* 52 (1988): 174-89; Shaw, "Media Credibility: Taking the Measure of a Measure"; S. Shyam Sundar, "Exploring Receivers' Criteria for Perception of Print and Online News," *Journalism & Mass Communication Quarterly* 76 (spring 1999): 373-86; Wanta and Hu, "The Effects of Credibility, Reliance, and Exposure on Media Agenda-Setting: A Path Analysis Model"; West, "Validating a Scale for the Measurement of Credibility: A Covariance Structure Modeling Approach"; Westley and Severin, "Some Correlates of Media Credibility"; Mark Zanna and Steven M. del Vecchio, "Perceived Credibility of Television News: A Matter of Viewers' Attitudes and the Position Taken by the Media," *European Journal of Social Psychology* 3 (1973): 213-16.

54. Barrett, *NetResearch: Finding Information Online*; Scott, "Evaluating Information on the Internet"; Caruso, "Before You Cite a Site"; Gilster, *Digital Literacy*; Harris, *An Internet Education: A Guide to Doing Research on the Internet*; Jones, *Exploring the Internet: Using Critical Thinking Skills*; Kapoun, *Teaching Undergrads Web Evaluation: A Guide for Library Instruction*; Tate and Alexander, "Teaching Critical Evaluation Skills for World Wide Web Resources"; see also bibliographies in Alexander and Tate, *Web Evaluation Techniques: Bibliography*; Montecino, *Guidelines for Critiquing Web Sites and Web Style Manuals*; Smith, *Evaluation of Information Sources*.

Accuracy refers to the degree to which the web site is free from errors, whether the information can be verified elsewhere offline, and the reliability of the information on the site. The authority of a web site may be assessed by noting who authored the site and whether contact information is provided for that person or organization, what the author's credentials, qualifications, and affiliations are, and whether the web site is recommended by a trusted source. Objectivity involves identifying the purpose of the site and whether the information provided is fact or opinion. Currency refers to whether the information is up-to-date and coverage is the comprehensiveness or depth of the information provided on the site.

55. News and current events information was described as "information you get about political events, public interest items, or current affairs." Respondents were told that "this information is about what is going on in the world, either locally or elsewhere." Reference or factual information was "information such as things you might want to look up or refer to" and examples included "directories (addresses, phone numbers), maps, dictionaries or encyclopedias, or facts you are interested in (such as sports trivia or quotations)." Commercial or product information referred to "information you might get about products you are considering purchasing or about companies you want to learn more about" that can include "descriptions, prices, or ratings of products you are thinking of buying or general information about an organization or company." Finally, respondents were told to think of entertainment as information that "appeals primarily to you for entertainment purposes," such as "entertainment programming, games, hobbies, or gossip."

56. All possible contrast tests were conducted, but not all are reported in Table 2 due to space limitations. The contrasts reported in Table 2 show all meaningful differences. Consequently, the contrasts that are absent from the table are those that were obviated by the contrasts reported (e.g., because the variables were ordered from high to low values prior to contrast tests, where the highest and lowest means are not significantly different, any means in between the highest and lowest must also not be different and, therefore,

would not be reported). A table containing the full set of statistics for the analysis is available from the authors.

57. Jacobson, "Mass Media Believability: A Study of Receiver Judgments"; Newport and Saad, "A Matter of Trust"; Roper Organization, *America's Watching: Public Attitudes toward Television*; see also Newhagen and Nass, "Differential Criteria for Evaluating Credibility of Newspapers and TV News."

58. Newhagen and Nass, "Differential Criteria for Evaluating Credibility of Newspapers and TV News."

59. Carter and Greenberg, "Newspapers or Television: Which Do You Believe?"; American Society of Newspaper Editors, "Newspaper Credibility: Building Reader Trust"; Greenberg, "Media Use and Believability: Some Multiple Correlates"; Johnson and Kaye, "Cruising Is Believing? Comparing Internet and Traditional Sources on Media Credibility Measures"; Rimmer and Weaver, "Different Questions, Different Answers? Media Use and Credibility"; Shaw, "Media Credibility: Taking the Measure of a Measure"; Wanta and Hu, "The Effects of Credibility, Reliance, and Exposure on Media Agenda-Setting: A Path Analysis Model"; Westley and Severin, "Some Correlates of Media Credibility"; Whitney, *The Media and the People: Soundings from Two Communities*.

60. Culbertson and Somerick, "Variables Affect How Persons View Unnamed News Sources"; Sundar, "Effect of Source Attribution on Perceptions of Online News Stories."

61. Gunther, "Biased Press or Biased Public? Attitudes toward Media Coverage of Social Groups."

62. Clausen, "A New Watchdog against Internet Fraud (Securities and Exchange Commission Office of Internet Enforcement Chief John Reed Stark)"; Gilster, *Digital Literacy*; Ken Liebeskind, "Credibility Problems Plague All Media," *Editor & Publisher*, 13 December 1997, 23; Moberg, Wood, and Dorfman, "Surfing the Net in Shallow Waters: Product Liability Concerns and Advertising on the Internet"; Realto, "Prescription Meds Meet the Web"; Sundar, "Effect of Source Attribution on Perceptions of Online News Stories"; Ulfelder, "Lies, Damn Lies and the Internet (Misinformation About Companies)"; Ward, "Surfing for the Suckers."

63. Gilster, *Digital Literacy*, 87.

THE INTERNET PROVIDES BOTH OPPORTUNITIES AND CHALLENGES FOR MASS COMMUNICATION RESEARCHERS

By Guido H. Stempel III and Robert K. Stewart

The Internet appears to be a mixed blessing. It offers new opportunities for both audience research and content analyses, yet old problems researchers have encountered over the years remain. Whether mass communication research will be better off or worse off will depend on the skill of researchers in using the Internet.

Each advance of technology opens new opportunities for research. Thus, during the twenty-first century, the Internet will offer unlimited possibilities for audience and content. This research will extend to broadcast and print media that have adapted their content to the Web.

The last major medium to reach the American scene was television a half century ago. At that time mass communication research was an emerging field, and television was well along the road before researchers joined the game.

The field was left to commercial researchers. Most notable was Nielsen, which began its television ratings in 1950 when there were only six million television sets in the country. Those ratings told us how many sets were tuned to a given program, and it was a decade before we realized how limited that information was. The ratings did not tell us whether one person or two persons or only the family dog was watching. They did not tell us the demographics of those who were watching. Networks used the ratings to decide whether to keep a program on the air and nobody mentioned that there was a sampling error of ± 3 percent in the ratings.

Furthermore, there was the unspoken assumption that ratings equaled how many people were watching the ads. That a viewer might leave the room during an ad was unthinkable. That myth has continued to the present era when the remote control has become standard TV equipment, rather than an expensive option. Zapping ads has become perhaps the second most popular indoor sport in America.

It was a decade before academic research established a presence, and by then the die had been cast. There were 55 million television sets in the United States by 1960, and 86 percent of the homes had sets. *Television in the Lives of Our Children*, published in 1961, offered a whole new perspective about television viewing and new insight for how television might be used to make children's lives better.¹ Among other things, it offered solid data that it wasn't watching television that kept children from learning how to read; it was inability to read that caused some children to watch a lot of television. However, the impact on the industry was minimal.

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