

Exploring Online News Credibility: The Relative Influence of Traditional and Technological Factors

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This study investigates a range of traditional and technological factors that contribute to credibility perceptions for three categories of online news sources. These sources include mainstream (usatoday.com, nytimes.com), independent (thedrugreport.com, axisoflogic.com), and index-type (news.google.com, yahoo.news.com) websites. While traditional dimensions of credibility remain influential, results suggest that the hypertextuality of index-type online news sources is of particular importance. Multimediality and interactivity did not influence credibility perceptions. These results support the perspective that online media differ based on credibility and users' perceptions are in part based on the technological affordances of media. A major contribution of this research lies in the empirical demonstration of the relationships between technological characteristics of various online news sources and subsequent credibility assessments.

Key words: online news, credibility, hypertext, interactivity, multimediality, hypertextuality.

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The Internet has emerged as the primary source of information for many Americans (Mitchelstein & Boczkowski, 2010). According to the Newspaper Association of America (2011), newspaper companies attracted more than 112 million unique visitors to their websites in August, almost two-thirds (65.1 percent) of all Internet users. Compared to a year ago, this reflects increases in total unique visitors (8.1 percent), total visits (29 percent), total pages viewed (15.5 percent), and total minutes (19.4 percent). All Internet users visited newspaper websites in the first quarter of 2009 reflecting more than a 10 percent increase from 2008 (Newspaper Association of America, 2009). Potts (2007) estimated that revenue from online news sources will surpass revenues generated by print media by 2018. It is clear that the Internet is changing the way news organizations conduct their business.

In November 2007 the New York Times announced the beta launch of *Times Extra*, an alternative view of their homepage which featured news headlines with links from third-party sources. *Times Extra* was designed to aggregate headlines from other news organizations and individual weblogs (blogs) across the Web, and match the most relevant sources with lead articles on the *nytimes.com* home page. This shift in news content creation and dissemination is symptomatic of a growing trend where the hyperlink nature of the Internet combined with a culture of online participation (i.e., Web 2.0) has enabled people to transition from content consumers to producers. However,

there are pressing questions regarding the quality and accuracy of user-generated, news-related information.

A common criticism is that Web-based information often does not reach sufficient levels of factual substantiation or analysis, and there is little pressure to present truthful and unbiased information (Johnson & Kaye, 2010a). The presence of biased and misleading information has called the credibility of these hybrid news sources into question (Cassidy, 2007). Contrary to those concerns, some studies addressing the credibility of online information showed that people tended to have positive attitudes toward the credibility of these sources (Kim & Johnson, 2009).

While not all of the credibility research found online sources as credible as traditional media, mixed findings on the perceived credibility of online information were reported (Kim & Johnson, 2009). Also, although the number of studies examining online news credibility has increased, most research uses traditional media credibility as a baseline and the corpus of online news sources studied is usually restricted to those that redistribute content from traditional newspaper organizations (Flanagin & Metzger, 2003; Johnson & Kaye, 2010b; Kim & Johnson, 2009; Park, 2006). Further, this body of credibility research has not addressed the unique characteristics of news content delivered online.

The purpose of the current study is to determine which factors affect the credibility of information from Internet-based news providers and to explore the relationships between online news sources' credibility characteristics including hypertextuality, interactivity, and multimodality, and the use of the online news sources. As these channels for news consumption and production mature, criteria for evaluating these sources need to be developed. To achieve these goals, this study divides online news sources into three categories according to their characteristics—mainstream, independent, and index online news sources—and explores dimensions of perceived credibility to provide a more comprehensive understanding of the nature of online news sources.

Literature Review

Online News

While newspapers are one of the oldest forms of contemporary media (Mitchelstein & Boczkowski, 2010), the Internet is challenging traditional news delivery methods (Chung, 2008). News content on the Internet has evolved in three stages (Pavlik, 1997). Briefly, the first stage which is still the most popular is characterized by simply the reproduction of content available through traditional printed news sources and includes early versions of sites like *usatoday.com* and *nytimes.com*. The second stage is characterized by the creation of original content with the addition of hyperlinks that enable access to additional information. In the third stage consumers are presented with original content designed specifically for the Internet. The last stage is characterized by a willingness to rethink the nature of community online and a willingness to experiment with new forms of storytelling and involves immersive storytelling which allows readers to navigate through content in ways that extend beyond linear presentation of information. Now users can contribute by posting their opinions, commentary, or even links to related information sources through hyperlinks (Bruns, 2005). For example, *nytimes.com* allows readers to add their own comments and information to individual articles, thus affording the opportunity for interaction with the content and other readers.

While market types (Dibean & Garrison, 2001) and cybergenres (Ihlström & Åkesson, 2004) have been used to categorized online newspapers, Deuze (2001, 2003) measured the range of content and the level of participatory communication available to readers and categorized online news sources into four types: mainstream news sites, index and category sites, meta and comment sites, and share and discussion sites. For the purposes of this discussion it is important to note that the last two categories are

outside the bounds of structured online news sources because they are comprised entirely by content produced by the general public. Although these sites have utility, and some are quite popular, they are not relevant to online news sources with distinct boundaries between news producers and consumers. Thus, the current study categorizes online news sources into three types: mainstream, independent, and index-type news sources. These three categories encompass the majority of online news sources.

The most prevalent type sources are mainstream online news that distribute the same content available through their offline counterparts (i.e., *usatoday.com* or *nytimes.com*). These sites are very similar to their offline counterparts as they employ specialized journalists and are equipped with well-organized news production systems. Independent online news sources lack the organizational complexity of mainstream sources (editorial staff, etc.) and focus on the production and distribution of news limited to their own websites, such as the *Drudge Report* (*drudgereport.com*) and *Axis of Logic* (*axisoflogic.com*). These organizations present specialized news and content written by their contributors. Since they operate on much smaller budgets, these sites minimize labor costs related to news production and distribution. Finally, index news sources like *news.google.com* and *news.yahoo.com* aggregate content from thousands of news sources, search engines and Internet portals. News stories are often categorized and annotated by editorial teams and these sites are known for their algorithm-based editing, opposed to human editors. Index sites like these have emerged as major news sources and should be included in comparative investigations regarding credibility perceptions.

Credibility Online

Credibility is a perceived quality based on multiple factors, including trustworthiness and expertise (Fogg & Tseng, 1999). Credibility is attributed to message sources by recipients during information exchange. The majority of online credibility research focuses on politics or news information (Johnson & Kaye, 2010a, 2010b; Metzger, Flanagin, & Medders, 2010; Mitchelstein & Boczkowski, 2010). Past research on media credibility has helped scholars understand the relative credibility of online media as a conduit of information compared to more traditional channels (Chung, Kim, & Kim, 2010; Metzger et al., 2003).

The concept of credibility has been researched along source, message, and media dimensions, and most literature on new media relies on these measures (Metzger et al., 2003). For example, early research focused on source credibility by examining the accuracy of reporting in news (Gaziano & McGrath, 1986). Internet-related credibility research draws mainly from source credibility and the interpersonal communication literature, but also includes items from the traditional media credibility literature. Common variables include the extent to which websites and information online is believable, trustworthy, unbiased, etc. Other dimensions include assessments of accuracy, relevance, and comprehensiveness (Metzger et al., 2003). However, since Hovland, Janis, and Kelly (1953) first began studying credibility, communication scholars have identified trustworthiness and expertise as two primary dimensions of credibility assessment (Chung et al., 2010; Fogg & Tseng, 1999).

Sundar (1999) suggested that a credibility scale for both traditional and online news sources is appropriate by arguing that striking similarities exist between the factor structures underlying receivers' perceptions of print and online news. This similarity made it possible to use the same scale for different media. Considering that researchers have already transferred the dimensions of media credibility from offline to online contexts, the current study adapts items from earlier credibility studies to explore the credibility of online news sources. Research on the technological affordances of online news sources originate from the communication technology discipline (Walther, Gay, & Hancock, 2005). Thus, this study focuses on the 'added value' of Internet news sources: interactivity, hypertextuality, and multimodality which have been regarded as important variables in online journalism research.

Although many studies have described the characteristics of online media, few have considered how the unique technological elements afforded by the Internet may affect their perceived credibility. Most online news credibility research weighs perceived credibility against that of traditional media. Moreover, the range of the online news sources examined is usually restricted to online versions of mainstream news sources. Indeed, studies of Internet news media have focused primarily on the dominance of existing media. Accordingly, researchers have not dealt with the relationships between the various types of online news sources and perceptions regarding their credibility. The current research seeks to fill this gap. Thus, the following hypothesis is presented to address the varying characteristics of online news sources and perceived credibility:

H1: There are differences in credibility assessments among online news sources.

Technological Characteristics of Online News Sources

The focus of the current study is news sources available online. This operationalization is conceptually distinct from traditional venues for journalism due to the technology involved (Deuze, 2001). Online sources of news information are working to distinguish their product from traditional ones using technological affordances such as interactivity (Johnson & Kaye, 2010b). However, although new communication technologies have diffused to individuals, communities, and societies, media credibility is still under evaluated (Kang, 2009). When structural features and characteristics of online media are discussed, scholars generally have focused on three essential qualities of online journalism: interactivity, multimodality, and hypertextuality (Bardoel & Deuze, 2001; Cassidy, 2007; Deuze, 2003; Oblak, 2005; Paulussen, 2004).

Interactivity. Interactivity is considered one of the most important capacities of new media (Rogers, 1986) and is operationalized as a variable quality of communication media reflecting the degree to which readers can interact with news content (Chung, 2008; Rafaeli & Sudweeks, 1997). In traditional media, users control which messages they receive, but have no control over the messages themselves. For example, people routinely make channel selections for traditional broadcast media like television and radio, but they are limited to a receiver role. However, new media afford users the freedom to both select and reply to messages, allowing them to customize the experience according to their needs (Bruns, 2005; Johnson & Kaye, 2010a; Metzger et al., 2010).

Heeter (1989) identified six dimensions of interactivity: complexity of choice available, the level of effort necessary, responsiveness to the user, monitoring information use, ease of adding information, and facilitation of interpersonal communication. Among six dimensions, Massey and Levy (1999) argue four dimensions including complexity of choice available, responsiveness to the user, facilitation of interpersonal communication, and ease of adding information, can be applied to online media production. Chung (2008) suggested users' increased news choice, personalized tailoring, customized options, and interpersonal communication opportunities as primary presentation styles of online news. Opgenhaffen and D'Haenens (2009) identified five interactivity features enhancing control over content based on content analysis: choice of frequency, choice by categories, onsite search by keyword, possibility to personalize content, and possibility to print the message.

Online news sources enable website visitors to respond to, interact with or even customize stories. In the context of online news, interactivity facilitates the active consumption of information (Chung, 2008; Kopper, Kolthoff, & Czepek, 2000; Pavlik, 1997) and users often share this content with their peers. Typical tools available online include text-based forums like chat rooms, bulletin boards, searchable databases and biographical information about reporters and columnists in addition

to links for contacting journalists through email (Dibean & Garrison, 2001; Dimitrova et al., 2003; Himelboim, 2010).

Multimediality. In addition, online news sources have the ability to manipulate media formats to best tell stories. Multimediality refers to the extent to which text, graphics, and (moving) images with sound are translated and integrated into a common digital form (Carpenter, 2010; Wise, Bolls, Myers, & Sternadori, 2009). All of these elements are incorporated and available via the Internet and online news sources. These multimedia links are notable and valuable additions for online news sources because they represent the convergence of all forms of traditional mass media transmissions (Dimitrova et al., 2003; Wise et al., 2009).

Several studies have investigated the impact of multimedia features from online news such as pictures, audio, and video (Oppeghaffen & D'Haenens, 2009). As measurements of multimediality of online news sources, Paulussen (2004) proposed the acknowledgement of photos or drawings, slideshows, and audio and video cues as appropriate criteria for assessing the multimediality of online news. Kioussis and Dimitrova (2006) used three levels of multimedia content available in news stories: text only for the low condition, text and pictures (including a photo gallery) for the moderate condition, and video with text and pictures for high condition.

Hypertextuality. Online news sources must also consider ways to connect stories, archives, and resources through hyperlinks. Today, online news sources provide a high degree of interactivity, multimediality, and hypertextuality and there is a growing consensus that these characteristics are central to the classification and description of online news sources (Cassidy, 2007; Deuze, 2001). When individuals visit these websites, they negotiate several of these modalities simultaneously and the hyperlink structure of news content enables users play an active role in seeking out additional information. This too creates more interactive experiences (Sundar, Xu, & Bellur, 2010).

Hypertextuality (or hyperlink) affords control over the information-seeking process online (Carpenter, 2010; Himelboim, 2010; Vargo et al., 2000). Hypertextuality is a fundamental characteristic of the Internet (Deuze, 2001) which refers to the ability to connect within-sites and otherwise disparate webpages through clicking on a word, phrase, or graphic image (Carpenter, 2010; Deuze, 2003; Hall, 2001). It also allows users to follow their own interests and interactive searching. However, Deuze (2001) suggests few contemporary news websites embed hyperlinks effectively; links to information external to the online news source is especially lacking. The little literature in existence on news media's use of external hyperlinks represents the news websites have not take full advantage of this opportunity (Himelboim, 2010).

Online search engines such as Google and Yahoo count the number of distinct hyperlinks that point to a given webpage as an indication of how important the webpage is and news items are ranked according to the reliability of the news publishers (Zeng & Wang, 2009). Also hyperlinks enrich users' online journey by adding background information and providing more context to a developing news story (Dimitrova & Neznaski, 2006). Thus, the archival depth and the broad scope of online news obtained through hyperlinks to related information on the Internet could enhance the perceived credibility of online news. Textual hyperlinks related to current and archived articles, original information sources, and relevant audio or video files were used as measurements of the journalistic potentialities offered by the Internet (Zamith, 2008). As parameters for measuring the archival capacity of news site, extensiveness, accessibility, search ability, and up-to-dateness have also been considered (Paulussen, 2004). The dynamism of websites—a function of interactivity, multimediality, and hypertextuality—may influence credibility assessments, but these factors have rarely been explored in communication research (Kioussis & Dimitrova, 2006; Metzger et al., 2003). In particular, no research

on the relationship between hypertextuality and credibility of online news sources has been reported. This paper examines these variables in depth by proposing the following research question:

R1: Do technological characteristics, including interactivity, multimodality, and hypertextuality, influence credibility assessments of online news?

Methods

Participants and Procedure

Participants were recruited from introductory communication classes ($N = 288$, 47 percent male) at a large university in the northeastern United States. The mean age of participants was 19 years ($M = 19.75$, $Median = 19$, $SD = 1.78$). About four-fifths of the respondents were Caucasian ($n = 231$). About 90% of participants consumed news from online sources making the Internet the most frequently identified source of news in this study. While college student samples are sometimes criticized, they are useful due to their homogeneity. Also young people are the primary consumers of online news and their news consumption patterns form when they attend college (Diddi & LaRose, 2006; Jones, Johnson-Yale, Millermaier, & Pérez, 2009; Kioussis & Dimitrova, 2006). Participants were asked to complete a survey designed to measure credibility assessments for six online news sources. The protocol and all survey measures were approved by the institution's review board, and participation was voluntary.

Measures

To address the hypotheses, a pool of measures was generated based on items available in extant literature. The survey instrument included traditional credibility scales and technological characteristics of online news sources adapted from research on online news credibility and technology including trustworthiness, expertise, interactivity, hypertextuality, and multimodality (Deuze, 2001; Dibeau & Garrison, 2001; Dimitrova et al., 2003; Heeter, 1989; Gaziano & McGrath, 1986; Paulussen, 2004).

All items were measured using 7-point Likert-type scales ranging from 1 (strongly disagree) to 7 (strongly agree). Perceived trustworthiness was measured using "fair," "unbiased," "objective," and "delivering a diversity of opinions" (Cronbach's $\alpha = .91$). Perceived expertise was measured using three items such as "professional," "in-depth," and "written by professional journalists," $\alpha = .86$. Perceived interactivity was also measured using three items including "easy to response," "adds information easily," and "represents user's choice," $\alpha = .88$. Perceived multimodality was measured by the degree of outward appearances such as "showy," "uses graphs, figures or photos," and whether sites were viewed as "flashy," $\alpha = .90$. Perceived hypertextuality was measured using three items including "easy to access via clicking," "presenting other texts simultaneously," and "easily shared with others via link," $\alpha = .90$. Lastly, perceived credibility was measured with one item which measured how credible (1 = not credible, 7 = very credible) each news source was viewed.

A list from the American Journal Review (2008) was used to select mainstream online news sources. *Usatoday.com* and *nytimes.com* were selected to represent mainstream online news sources. The former is linked to news Website for the largest selling all-around daily nationwide newspaper and the latter is one of the most prestigious and popular metro newspapers (Pew Research Center, 2011). The *Drudge Report* (*drudgereport.com*) and *Axis of Logic* (*axisoflogic.com*) which have been alternative media of political and international news were selected to represent independent-type online news sources (Jones, 2003). A report from the Pew Research Center (2007) was used to guide the selection of *news.google.com* and *news.yahoo.com* for the index type of online news sources in this study as 60% of younger Internet

users (those 18 to 29 years old) who follow political news get information about campaigns from these websites. Alexa.com (2010) listed *Google News* and *Yahoo News* as top two news sources aggregating headlines and full coverage of current issues as search engines of many of the world's news sources.

Results

To test H1, a one way-ANOVA was conducted to test the mean differences of overall credibility assessments among the online news sources used in this study. The results showed that there was statistically significant differences among three types of online news sources in overall evaluations of credibility, $F(5,1714) = 197.1$, $p < .01$. *Nytimes.com* had the highest credibility overall ($M = 5.6$, $SD = 1.4$) and *axisoflogic.com* had the lowest ($M = 3.8$, $SD = .10$).

One way-ANOVAs were conducted to test the mean differences of both traditional credibility factors and technological factors between the mainstream, independent, and index type online news sources. The results indicated that there were significant differences among the categories of online news sources including trustworthiness, $F(5,1717) = 32.0$, $p < .01$, expertise, $F(5,1717) = 164.2$, $p < .01$, interactivity, $F(5,1714) = 38.3$, $p < .01$, hypertextuality, $F(5,1719) = 60.1$, $p < .01$, and multimodality, $F(5,1712) = 29.3$, $p < .01$ (see Table 1, below).

Overall, participants rated independent online news sources lowest in credibility while they evaluated mainstream sources highest on traditional credibility factors like perceived trustworthiness and expertise. In addition, results indicate that *news.google.com* had the highest scores on all technological dimensions including interactivity, hypertextuality, and multimodality. This site was followed by *news.yahoo.com*, while independent-type online news sources had relatively lower scores on all three technological dimensions. Also, post hoc tests revealed significant differences among three types of online news sources in terms of hypertextuality and multimodality.

To get an overall picture of how strongly the included factors relate to each type of online news source credibility and examine R1, hierarchical regressions were conducted. Hierarchical regression accounts for a unique partitioning of the total variance of the criterion factors as indicated by the increase in R^2 (Cohen & Cohen, 1983). In each analysis, three blocks of independent variables were entered in the following order: (1) demographics, (2) traditional credibility factors, and (3) technological factors, so that both variances of individual variables and the criterion factors can be tested. The correlations among variables are reported in Table 2 and the results from the regression models are reported in Table 3, below.

For H1, the final model for the *nytimes.com* explained about 53% of the variance ($F = 38.64$, $p < .01$). Both trustworthiness and expertise as traditional news credibility factors were strong predictors ($\beta = .35$ and $.47$, respectively) and contributed a significant increase in variance explained ($\Delta R^2 = .45$, $p < .01$). On the contrary, results suggest that the technological factors of interactivity, multimodality, and hypertextuality did not contribute to credibility of *nytimes.com* ($\Delta R^2 = .01$, $p > .05$).

Likewise, only traditional factors of news credibility contributed to *usatoday.com*'s credibility ($\Delta R^2 = .40$, $p < .01$) but technology factors did not change the R^2 significantly meaning they failed to influence credibility ($\Delta R^2 = .01$, $p > .05$). In the final regression model, only two traditional credibility factors, trustworthiness and expertise, were significant ($\beta = .32$ and $.41$, respectively). For R1, the results from the regressions regarding both independent-type online news sources indicated that the predictors in the final models accounted for less of the variance in credibility than those in models of above mainstream types (*Axis of logic*, $R^2 = .27$, $F = 12.59$, $p < .01$; *Drudge Report* $R^2 = .21$, $F = 9.29$, $p < .01$). In both cases, trustworthiness and expertise were statistically significant (*axisoflogic.com*, trustworthiness $\beta = .36$ and expertise $\beta = .23$; *drudgereport.com*, trustworthiness

Table 1 Comparison of traditional credibility factors and technology factors

		M	SD
Trustworthiness	New York Times	4.5	1.2
	USA Today	4.6	1.1
	Axis of Logic	3.9	0.7
	Drudge Report	3.9	0.7
	Yahoo	4.4	1.0
	Google	4.5	1.0
	Total	4.3	1.0
Expertise	New York Times	5.9	1.1
	USA Today	5.8	1.1
	Axis of Logic	4.1	0.8
	Drudge Report	4.1	0.8
	Yahoo	4.7	1.1
	Google	4.8	1.1
	Total	4.9	1.3
Interactivity	New York Times	4.8	1.0
	USA Today	4.8	0.9
	Axis of Logic	4.2	0.7
	Drudge Report	4.2	0.7
	Yahoo	4.9	0.9
	Google	4.9	0.9
	Total	4.6	0.9
Hypertextuality	New York Times	5.3	1.1
	USA Today	5.3	1.1
	Axis of Logic	4.5	0.9
	Drudge Report	4.6	1.0
	Yahoo	5.6	1.0
	Google	5.6	1.0
	Total	5.1	1.1
Multimediality	New York Times	4.4	1.2
	USA Today	4.6	1.2
	Axis of Logic	4.1	0.7
	Drudge Report	4.2	0.8
	Yahoo	4.9	1.2
	Google	4.9	1.2
	Total	4.5	1.1
Credibility	New York Times	5.6	1.4
	USA Today	5.6	1.3
	Axis of Logic	3.8	1.0
	Drudge Report	3.8	1.0
	Yahoo	5.1	1.3
	Google	5.1	1.2
	Total	4.8	1.4

Table 2 Correlations among variables ($N = 288$)

		2	3	4	5	6
NYT	1. Credibility	.57**	.64**	.33**	.08	.35**
	2. Trustworthiness	—	.45**	.45**	.12*	.28**
	3. Expertise		—	.45**	.06	.45**
	4. Interactivity			—	.25**	.46**
	5. Multimediality				—	.24**
	6. Hypertextuality					—
USA Today	1. Credibility	.52**	.58**	.32**	.12*	.34**
	2. Trustworthiness	—	.46**	.43**	.11	.29**
	3. Expertise		—	.44**	.10	.45**
	4. Interactivity			—	.30**	.40**
	5. Multimediality				—	.22**
	6. Hypertextuality					—
Axis of Logic	1. Credibility	.45**	.39**	.26**	.12*	.19**
	2. Trustworthiness	—	.36**	.20**	.08	.17**
	3. Expertise		—	.48**	.31**	.42**
	4. Interactivity			—	.45**	.40**
	5. Multimediality				—	.29**
	6. Hypertextuality					—
Drudge Report	1. Credibility	.41**	.34**	.13*	-.01	.13*
	2. Trustworthiness	—	.39**	.19**	.10	.07
	3. Expertise		—	.38**	.22**	.32**
	4. Interactivity			—	.47**	.38**
	5. Multimediality				—	.31**
	6. Hypertextuality					—
Yahoo	1. Credibility	.49**	.47**	.26**	.04	.28**
	2. Trustworthiness	—	.50**	.41**	.08	.23**
	3. Expertise		—	.38**	.08	.25**
	4. Interactivity			—	.36**	.50**
	5. Multimediality				—	.32**
	6. Hypertextuality					—
Google	1. Credibility	.52**	.45**	.29**	.054	.32**
	2. Trustworthiness	—	.50**	.43**	.11	.29**
	3. Expertise		—	.39**	.12*	.28**
	4. Interactivity			—	.38**	.51**
	5. Multimediality				—	.32**
	6. Hypertextuality					—

* $p < .05$ ** $p < .01$, (2-tailed).

$\beta = .33$ and expertise $\beta = .20$). However, results suggest that technological factors did not contribute to credibility (axisoflogic.com, $\Delta R^2 = .004$, $p > .05$; drudgereport.com, $\Delta R^2 = .009$, $p > .05$) and none of the technological factors were significant.

Technology factors significantly contributed to perceptions of credibility for news.yahoo.com and news.google.com. Both final models explained about 35% of the total variance. Although technological

Table 3 Hierarchical multiregression models explaining online news sources

	Model I	Model II	Model III	Model I	Model II	Model III
	New York Times			USA Today		
	β	β	β	β	β	β
Gender	.15**	0.06	0.06	0.06	0.00	0.00
Age	−0.26	−0.14	−0.15	−0.24	−0.17	−0.17
Education	0.14	0.06	0.06	.165*	0.10	0.10
Trustworthiness		.33**	.35*		.32**	.32**
Expertise		.47**	.47*		.42**	.41**
Interactivity			−0.10			−0.06
Multimediality			0.01			0.05
Hypertextuality			0.07			0.06
R ²	.07**	.52**	.53**	.04*	.43**	.44**
(ΔR^2)		(.45**)	−0.01		(.39**)	(0.01)
	Axis of Logic			Drudge Report		
	β	β	β	β	β	β
Gender	0.09	0.04	0.03	0.10	0.05	0.05
Age	−0.03	−0.09	−0.08	0.03	−0.02	−0.02
Education	0.05	0.07	0.07	0.04	0.08	0.07
Trustworthiness		.36**	.36**		.32**	.33**
Expertise		.26**	.23**		.20**	.20**
Interactivity			0.07			0.01
Multimediality			−0.01			−0.10
Hypertextuality			0.00			0.06
R ²	.01	.27**	.27**	.01	.21**	.22**
(ΔR^2)		(.26**)	0.00		(.20**)	(.01)
	Yahoo			Google		
	β	β	β	β	β	β
Gender	−0.03	0.03	0.03	−0.03	0.03	0.02
Age	0.01	0.04	0.04	0.02	0.02	0.02
Education	0.03	0.02	0.01	0.08	0.08	0.07
Trustworthiness		.35**	0.34		.39**	.37**
Expertise		.30**	0.29		.26**	.24**
Interactivity			−0.07			−0.05
Multimediality			−0.04			−0.06
Hypertextuality			.18**			.18**
R ²	0.00	.31**	.34**	0.01	.32**	.35**
(ΔR^2)		(.31**)	(.02*)		(.31**)	(.03*)

* $p < .05$ ** $p < .01$

factors in both regression models changed the R^2 significantly (Yahoo $\Delta R^2 = .024$; Google $\Delta R^2 = .025$), only hypertextuality was significant in both models (Yahoo, $\beta = .18$ and Google, $\beta = .18$). These results are summarized in Table 3.

In addition, demographic variables such as gender, age, and education were included in the regression models. However, mainstream news was the only category that showed negative relationships between credibility and age suggesting that younger people rated mainstream online news sources as more credible.

Discussion

The Internet presents new market opportunities for traditional news organizations and has also opened the door for competition from nontraditional news sources. Indeed, the number of online news readers increased rapidly with the popularization of the Internet. Consequently, online news sources are cultivating their own markets and the Internet has emerged as a new form of mass media and a channel for information distribution. However, even with such rapidly growing influence, online news sources are still regarded as atypical and viewed with a bit of skepticism. Therefore, positioning online news sources in the media spectrum is a significant event and perceptions of credibility remain critical to the success of these information sources.

The concept of credibility is complex and has been operationalized along a range of dimensions. Researchers have used a range of approaches to evaluate credibility, as well. However, scientific research on the credibility of online news sources categorized by the features of the site, the scale of capital, and the use of trained journalists is not sufficient. Most credibility studies of online news sources have compared the credibility of online sources with traditional media outlets. In addition, the range of online news sources has been restricted within mainstream types of online news sources which are basically a facsimile of printed news sources.

To fill this gap in the literature, the current study investigated factors contributing to credibility perceptions regarding online news sources and how these perceptions differ according to the type of news source. Results indicate that both expertise and trustworthiness—traditionally considered sub-constructs of traditional newspaper credibility—also contributed to the credibility of *usatoday.com* and *nytimes.com*. However, technological factors including hypertextuality, interactivity, and multimediality failed to affect readers' perceptions. The results of regression analyses explaining perceived credibility of the *drudgereport.com* and *axisoflogic.com* were similar to that of mainstream online news sources. These models suggest that only trustworthiness and expertise explained the credibility of independent news sources, and participants rated them lowest. Interestingly, the analyses revealed that hypertextuality—a technological factor—significantly contributed to the credibility of *news.google.com* and *news.yahoo.com*. This is probably because index type news sources offer links to diverse news sites that enhance users' information seeking opportunities and provide them with easier ways to navigate through large amounts of information or specific news items in depth.

The content of online versions of mainstream news sources like *usatoday.com* and *nytimes.com* are essentially reproduced from content found in their printed counterparts. Here, news sources are generally stated clearly and reports are written by specialized journalists. Meanwhile, independent news sources like *drudgereport.com* and *axisoflogic.com* tend to evoke assessments of insufficient professionalism among audiences when compared to information from mainstream sources despite providing specialized news and professional commentary. In particular, low credibility perceptions for independent news sources seem to be due to not only the origin of online news sources, but also their characteristics. Online newspapers started their service as gossip sheets for political events. Unlike

other online news sources, they do not have a recognized editorial policy or gatekeeping system and are associated with strong biases; as such, independent online news sources were rated lowest in all dimensions of credibility.

However, technological characteristics only contributed to the credibility of index type news sources like news.google.com and news.yahoo.com. Participants perceived that these sources have more interactive, multimedia, and hypertext characteristics than the other information sources used in this study. In particular, well-designed hyperlinks allowing for easy access via clicking, the ability to share information with others easily, and the presentation of related news seem to be important factors explaining the credibility of index online sources as the audience expects these sources to provide various news content and hyperlinking to related stories and content. While online newspaper editors in the U.S. ranked the inclusion of interactivity and multimodality low as important qualities (Gladney, Shapiro, & Castaldo, 2007), linking through search engines to other content and enabling access to multiple perspectives may help readers understand issues more deeply. Moreover, through offering highly visited websites and enabling better information processing or news storage, hyperlinks can enhance the credibility of news sources and the strategies of hyperlinks connecting other news sources become important in online news.

Notably, the overall credibility level of mainstream news sources was robust suggesting these groups of news providers benefit from their extant offline reputation. In comparing the results investigating the differences between mainstream and index type sources, the issue of expertise is noteworthy. This result can be explained in two ways. Readily identifiable mainstream online news sources have not only professional news production systems, but also the brand advantage associated with their offline printed news sources. On the contrary, the issue of trustworthiness is less pronounced. Readers perceive both the mainstream and index sources as being fair, objective, and unbiased compared to independent type online news sources. This is because index type online sources like news.google.com and news.yahoo.com provide news content from a wide range of online sources and offer links to other news sites including mainly mainstream type online sources. By linking to a range of other news sources, index news sites provide supplementary information concerning the quality and reliability of the search results.

Conclusion

This study investigated traditional and technological factors that contribute to credibility perceptions for three categories of online news sources. While traditional dimensions of credibility remain influential, results suggest that the hypertextuality of index news sources is of particular importance. Multimodality and interactivity did not influence credibility perceptions. These results support the perspective that online media differ widely based on credibility and users' perceptions are in part based on the technological affordances of the media. Specifically, the extensive use of hypertext links, ranking according to popularity or reliability of the news publishers, and the provision of near-limitless choices from Google and Yahoo news seem to give users an impression that the content linked is credible. This implies that just "being online" does not add much credibility if sites do not employ hyperlinks to extend access to related topics and users fail to choose multimedia features, control the flow of additional information, and actively respond to content.

The value of this research is that it divides online news sources into three categories according to their individual characteristics: mainstream, independent, and index. These three types of news sources encompass the vast majority online news sites, which makes this study unique. A major contribution of this research lies in the empirical demonstration of the relationship between perceptions of online

news credibility and the technological characteristics associated with these sites by taking account attributes like hypertextuality, interactivity, and multimodality. Furthermore, the results suggest that online media have diverse levels of credibility which are contingent upon the nature of their design and format. More research on these design characteristics is needed as this exploratory study is limited by the samples used from each of the three categories of news sources.

Considering that this study used a college student sample, the results should be interpreted cautiously. In addition, there may also be cognitive differences in how individuals process traditional print media, opposed to online media. Further research focusing on news consumption preferences, reader motivation, the sharing of news production processes with users, and diverse characteristics of online news sources is needed to gain a more comprehensive understanding of the nature of the relationship between specific characteristics of online news sources and people's perceptions of credibility.

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