Source Cues in Online News:

Is the Proximate Source more Powerful than Distal Sources?

**Hyunjin Kang, PhD student** (huk142@psu.edu)
College of Communications, The Pennsylvania State University
3635 E. 43rd Street Apt 201
Minneapolis MN, 55406

**Keunmin Bae, PhD student** (kub157@psu.edu)
College of Communications, The Pennsylvania State University
115 Carnegie Building, University Park PA, 16802-5101

**Shaoke Zhang, PhD student** (shaoke.zhang@gmail.com)
College of Information Sciences and Technology, The Pennsylvania State University
316C, Bldg of IST, University Park PA, 16802-5101

**S. Shyam Sundar, PhD** (sss12@psu.edu)
Distinguished Professor & Co-Director
Media Effects Research Laboratory (http://www.psu.edu/dept/medialab)
College of Communications, The Pennsylvania State University
122, Carnegie Building University Park, PA 16802-5101

&

World Class University (WCU) Visiting Professor
Department of Interaction Science, Sungkyunkwan University, Seoul, Korea

AUTHORS’ INFORMATION:

Hyunjin Kang and Keunmin Bae are Ph.D. students in the College of Communications at The Pennsylvania State University; Shaoke Zhang is a Ph.D. student in the College of Information Science and Technology at The Pennsylvania State University; S. Shyam Sundar is distinguished professor and co-director of the Media Effects Research Laboratory in the College of Communications, The Pennsylvania State University, and World Class University (WCU) visiting professor of Interaction Science at Sungkyunkwan University in Seoul, South Korea. This research was supported by the the Korea Science and Engineering Foundation under the WCU (World Class University) program funded by the Ministry of Education, Science and Technology, S. Korea (Grant No. R31-2008-000-10062-0).
Source Cues in Online News:
Is the Proximate Source more Powerful than Distal Sources?

Abstract

With the rise of intermediaries such as portals, social-bookmarking sites and microblogs, online news is often carried through multiple sources. However, the perceived credibility of the different source cues attached to a single news story can be quite different. So, how do readers evaluate the story? Do users factor in all distal sources, or do they simply refer to the proximate source delivering the news? We investigated this question with a 2 (involvement) x 2 (proximal source credibility) x 2 (distal source credibility) full-factorial between-subjects experiment (\(N = 231\)), and found that while highly involved readers considered both types of sources, low-involvement readers were primarily influenced by the proximate source.

Keywords: Online news credibility, Source layers, Dual process model
Source Cues in Online News: Is the Proximate Source more Powerful than Distal Sources?

When individuals obtain news or public-affairs information, they prefer getting it from an identifiable source. Studies have long shown that individuals evaluate messages based on the credibility of its source.\(^1\) This works well in traditional mass media (e.g., *The New York Times* or CNN), which feature one salient source for a given message. In online news, however, the identity of the source can be quite murky because there are often multiple layers of sources.\(^2\) On the Internet, we obtain news information from a number of different venues, ranging from websites of news media (e.g., nbc.com) to social-bookmarking sites (e.g., digg.com), social-networking sites (e.g., Facebook) and microblogs (e.g., Twitter). The issue of multiple sources is particularly apparent in news portals,\(^3\) such as Yahoo!News (http://news.yahoo.com), and news-aggregator sites, such as Google News (http://news.google.com), where each piece of news is accompanied by several source labels, often displayed together on the interface.

Given this chain of sources, an important consideration is the distance between particular sources and the readers. This distance would likely be perceived differently, depending on one’s understanding of the delivery sequence of a news story. On the other hand, readers may not process all visible source labels when they evaluate online news. The source label is generally viewed as a peripheral cue by dual-process models in social psychology. Such cues are said to trigger heuristic processing in favor of the more cognitively effortful systematic processing, unless there is sufficient motivation or involvement in the message.\(^4\) Therefore, involvement, motivation and ability of individuals could be associated with the degree of influence that proximate and distal sources have in our processing of online news. The study reported here offers an initial empirical examination of this possibility.
More specifically, the goal of this study is to determine which source cue is used by online users when they evaluate the credibility of information obtained from news portal sites such as Yahoo!News. Do users factor distal sources in evaluating news stories? Or, do they base it on the more proximate source, namely the portal site itself? We investigate these questions by examining the relative impact of a proximal source cue (specifically, a news portal site) and a distal source cue (a news media source), as a function of the reader’s level of involvement with the news topic.

**Literature Review**

*Source attribution of online news: Does psychological distance with source matter?*

Most traditional models of communication assume that source is the sender of communication and suggest four key components of communication processes—source, message, channel and receiver (SMCR). Given general conceptualization, it seems sufficient to simply present the information in order to be seen as a source by receivers. A news presenter, such as a TV anchorperson, can function as a gatekeeper and be perceived as a source. Because such professionals are often seen as selecting news and also directly interacting with their audiences, message receivers often perceive them as news sources. In the online domain, these gatekeepers appear in the form of news-aggregator sites, which are often run by bots or algorithms without human intervention, thus raising the question whether media technologies can also be regarded as sources. Several studies based on the Social Responses to Communication Technologies (SRCT) paradigm demonstrate that individuals apply social rules of human-human communication to their interactions with computers, treating computers as if they create or select content with motivations and intentions just as other traditional sources do, despite the fact that they are inanimate and cannot exercise journalistic judgment. Based on this notion, Sundar and
Nass explicitly included media technology in the conceptualization of online news sources, and argued that all of the elements in the chain of communication can be perceived and hence defined as sources. Depending upon which of these is made salient during a reader’s consumption of news, the researchers found that the reader’s evaluation of news content varies.

At some level, each of these could be considered a source because each one is responsible for bringing content to the receiver. But, what happens when they co-exist, as is often the case on the Web? For example, technological sources such as news aggregators (e.g., Google News) not only identify the technological source, but also the visible source on their interfaces. Under such circumstances, is there an implicit hierarchy of sources in the minds of news consumers? At least one study has shown that cues on the aggregator interface attributing a given story to a specific news media or visible source (e.g., The Washington Post) can be quite influential. But, can they over-ride the influence of the news portal itself? In other words, will a low-credibility news media diminish the perceived credibility of the story that appears in a high-credibility portal, and will a high-credibility news media enhance the credibility of the story that appears on a low-credibility portal? This puts forth another kind of cue, one relating to proximity, based on the user’s perceived sequence of virtual news delivery. Let us say that an Internet user picks up a news story from Google News and posts it on his/her blog, but the story had been originally produced by The New York Times (i.e. The New York Times -> Google News -> a blogger). If one reads the story on the blog, the reader would perceive the blogger/blog as more proximate than The New York Times. Therefore, multiple sources of an online message may be perceived as a set of layers with various levels of proximity to the reader, thus raising the following research questions: Which source cue is more influential when individuals process online news with
multiple layers of sources? Which factor would affect users’ source attribution? Answers to these questions will advance our understanding of credibility attributions for online content.

**Influence of source cues on online news credibility perception.** Source credibility is presumed to influence a receivers’ message evaluation, especially message credibility. In social psychology, credibility has long been perceived as an attribute of the source, and readers’ responses to a message are influenced by this attribution. Therefore, responding to news from a clearly credible or clearly non-credible source is relatively straightforward. However, when there are multiple sources, with differential attributions of credibility, it is unclear how users would be influenced by conflicting attributions to multiple sources. This is indeed the object of the current study.

Studies have investigated whether source cues influence the evaluation of a message or the processing of a message under various conditions. For instance, Chaiken and Maheswaran found that subjects’ attitudes toward a product were influenced not by argument ambiguity or the strength of the message but solely by the heuristic processing of the source credibility cue when the message was given low task importance. However, Freeman and Spyridarkis suggested a more complicated mechanism, claiming that both subjective perceptions of the source (e.g., perceived attractiveness of the source) and objective judgments of the information (e.g., perceived accuracy of information) come into play when individuals process information.

The recent development of newsbot technology adds new concerns to the relationship between source credibility and news evaluation. Newsbot algorithms select and sort countless news stories and generate headlines on the portal pages, but systematic patterns in their gatekeeping function can contribute to their credibility. Therefore, individuals may perceive their credibility differently in relation to the accumulated reputation of their labels, even though they
do not recognize or understand how their algorithms work. Thus, we can surmise that the brands of news portal sites influence news credibility just as traditional news companies do.

Therefore, reader’s perceptions of a particular news story’s credibility are not only dictated by the distal source (i.e., news media) to which the story is attributed but also the proximate source (i.e., news portal) via which the story is delivered. More formally, the following hypotheses and research question were used to guide our study:

\textit{H1: The proximate source credibility will be positively related to the perceived credibility of the news story.}

\textit{H2: The distal source credibility will be positively related to the perceived credibility of the news story.}

\textit{RQ1: What are the combination effects of proximate and distal source credibility upon news-credibility perception?}

\textbf{How does involvement with news story influence source attribution?} Heuristic Systematic Model (HSM) has long demonstrated that reader involvement is critical in determining the nature of information processing. It was originally proposed to explain cognitive processes that explain the impact of social influence efforts, moderated by individuals’ motivation to seek message validity. The extended version of HSM, however, suggests that the focal concepts of the model can be broadly applied to a variety of social judgments involving information processing,\textsuperscript{13} which includes news credibility evaluation.

HSM posits the existence of two qualitatively different routes of information processing: systematic and heuristic. According to the model, source credibility is a good example of a cue that triggers heuristic processing that requires less cognitive effort compared to systematic processing. Message involvement of the receiver is one of the
important factors that determine the type of cognitive route that s/he would follow for message processing. When individuals have high involvement with a message, they process the message by expending a good deal of cognitive effort, and evaluate the arguments contained in the message (i.e., systematic processing), but when they have low involvement, they tend to pay attention to heuristic cues (e.g., source credibility) rather than the central arguments of the message (i.e., heuristic processing).

It should be noted that the two modes of message processing may concurrently influence an individual's judgment of a message. HSM is guided by two competing psychological tendencies: “principle of least effort” and “motivational concerns.”

Given that cognitive resources of perceivers are finite, individuals seek to reach a conclusion with minimal expenditure of cognitive effort. However, if they have a strong motivation to process judgment-related information, they will override the principle of least effort by investing greater cognitive effort. Thus, HSM posits that receivers seek to balance their specific motivations for information processing and the cognitive effort that they must put forth; this phenomenon is called sufficiency principle.

The sufficiency principle is the crux of HSM's theoretical mechanism, and is based on “a continuum of judgmental confidence.” In order to make a judgment, one expends cognitive effort until there is no gap between these two points. When the gap between these two critical points becomes larger, either because of an increase in desired confidence (e.g., high motivation or involvement) or a decrease in actual confidence (e.g., discrepancy between heuristics and argument-relevant information), further cognitive effort is deployed for reaching the sufficiency threshold.
The HSM posits that not only judgment-relevant information but also heuristic cues may be processed even when the message receiver is highly involved with the message in order to minimize the gap between her/his desired confidence and actual confidence. Therefore, we propose that source credibility cues not only activate heuristic processing, but could also influence systematic processing.

In addition to exploring how issue involvement influences readers’ source attribution, thereby affecting news credibility evaluation, the current study tries to investigate which source cue(s) will be preferentially processed by a message receiver (i.e., news reader) when there are multiple heuristic cues (i.e., source cues) attached to a single message. According to the “principle of least effort,” an individual will process the bare minimum number of heuristic cues when s/he is less motivated, even when multiple cues are available. Thus, the basic premise of the study is that individuals will not tend to process all source cues that are available—or at least, they do not give them the same weight of cognition—when they consume online information. This assumption rests on the human tendency to cope with information overload by exhibiting cognitive miserliness. Based on this, we can expect that multiple source cues will be scrutinized more carefully by those who have high involvement with the news story than those who have low involvement.

However, it is unclear what makes the heuristic value of one cue stronger than that of another cue. A study argues that Internet users tend to rely on proximal cues as a way of coping with information-overload problems. In human-computer interactions, users orient themselves to the most proximate source cue (i.e., computer) when there are multiple layers of sources. Individuals orient to a distal source only when it is necessary for them to expend greater cognitive effort in order to be confident about the information,
as posited by HSM’s “sufficiency principle.”21 In sum, individuals tend to attribute a piece of online information to a source cue that is most proximal when they are not motivated to process the message carefully.

Hence, the study hypothesized that those who feel less motivated to expend cognitive effort will attribute news credibility to only the most proximate source cue. Also, as stated earlier, individuals with high involvement in a news story will scrutinize more of the available source cues when evaluating its credibility. Formally:

\[ H3: \text{There will be a significant three-way interaction between involvement, proximate source credibility, and distal source credibility on news credibility evaluation.} \]

\[ H3a: \text{Individuals with high involvement in the news topic will be sensitive to the credibility of both proximate and distal sources when evaluating news credibility.} \]

\[ H3b: \text{Individuals with low involvement in the news topic will be more sensitive to the credibility of proximate source than that of distal source when evaluating news credibility.} \]

**Method**

To investigate the research question and hypotheses, a 2 (involvement: low vs. high) x 2 (proximate source credibility: low vs. high) x 2 (distal source credibility: low vs. high) fully-crossed factorial experiment was conducted online.

**Participants.** Participants \((N = 231)\) were recruited from several undergraduate communication classes at a large US university. They were offered extra course credit in return for their participation. The participants received a consent form via email with a Web link.
directing them to the online stimuli for this experiment. The majority of the participants were Caucasian (66%), 62% were female, and the average age was 19 years (range: 18 to 30).

Procedure. The first page on the study site contained the informed consent form, which stated that the study’s purpose was to explore how users process online news. Upon providing their informed consent by clicking a hyperlinked button, participants landed on a simulated online news page with a single news story. Each participant was randomly assigned to one of eight news stories. Participants were allowed to spend as much time as they wanted reading the story, after which they were led to a questionnaire that asked them to rate the perceived credibility of the proximate and distal sources, and the news story, in addition to their level of involvement with the news story. They were then thanked and debriefed.

Stimulus Materials. Eight simulated versions of online news pages served as stimuli for the current study, with careful variations to reflect all possible combinations of the three independent variables. The layout of the page imitated a typical news site on the Internet. Each Web news portal page featured one of two news stories that were especially prepared for this experiment. A banner for the portal (i.e., High credibility-Google News; Low credibility-Drudge Report) was placed at the top left of the page with the news media’s logo placed next to the news story’s headline on the right (i.e., The New York Times or National Enquirer). For the two levels of involvement, two fictitious news stories were written based on related news material found on the Web. The high involvement news story was about tuition decrease plans for eastern state universities, including the one that the participants attended, for the upcoming school year. The low involvement news story featured a relief measure for people suffering in the subprime loan crises and a newly-launched online map of foreclosures, which was quite irrelevant to most of the students.²² (See Appendix 1)
**Measures.** Proximate and distal source credibility. We checked the manipulation of the proximate and distal source credibility with a 7-point Likert scale comprised of 13 items. The measures were comprised of adjectives describing participants’ perception of the news sources, such as reliable, credible and accurate. The scale measured participants’ perceived credibility of the proximate (p_proximate) and distal sources (p_distal) independently. Both scales showed high reliability (Cronbach’s $\alpha = .88$ for p_proximate; Cronbach $\alpha = .94$ for p_distal). Our manipulations of proximate and distal source credibility were successful: Participants rated Google significantly higher on credibility ($M = 4.59, SD = 0.74$) than Drudge Report ($M = 3.77, SD = 0.79$), $t(226) = 8.07, p < .001$, Cohen’s $d = 1.07$. Also, the perceived credibility of *The New York Times* ($M = 5.28, SD = 0.77$) was higher than that of *National Enquirer* ($M = 3.24, SD = 1.31$), $t(227) = 14.03, p < .001$, Cohen’s $d = 1.90$.

Interestingly, we found carry-over effects from one source to another, such that the credibility manipulation for the distal source had a main effect on the perceived credibility of the proximate source. Participants who were exposed to the high-credibility distal source (i.e., *The New York Times*) gave significantly higher ratings to the proximate source ($M = 4.31, SD = 0.83$) than those who were exposed to the low-credibility distal source (i.e., *National Enquirer*) ($M = 4.11, SD = 0.89$), $t (226) = 1.80, p < .05$, Cohen’s $d = 0.23$. This result indicates that perceived proximate source credibility is contingent upon not only the proximate source credibility cue, but also the credibility cue of the distal source, which is the origin of the news stories presented by the proximate source. Therefore, given this dependency among the two independent variables, scores of perceived proximate (p_proximate) and distal source credibility (p_distal) were analyzed as continuous independent-variable measures, in place of the dichotomous manipulated source credibility variables.
Involvement. We developed a 7-point scale to measure participants’ involvement with the news story to which they were exposed.²⁴ Nine semantic-differential items, such as “relevant” vs. “irrelevant” and “valuable” vs. “worthless,” were used (Cronbach’s α = .89). For the analyses, involvement was dummy-coded into two levels (high=1; low=0) (d_involvement). Our involvement manipulation was successful. Perceived involvement with the news story used for the high involvement condition was significantly higher (M = 4.46, SD = 1.21) than that with the news story for the low involvement condition (M = 3.59, SD = 1.16), t(229) = 5.55, p < .001, Cohen’s d = .73.

News credibility. The perceived credibility of the news stories was measured immediately after the participants read them, followed by source credibility measures. A 7-point Likert-type scale was applied to a total of 22 items.²⁵ The items were comprised of adjectives and phrases describing readers’ perception of the news, such as “accurate,” and “comprehensive” (Cronbach’s α = .87).

Results

We employed two sets of hierarchical regression tests.²⁶ The first-step model shows that p_proximate is a positive predictor of news credibility perception whereas p_distal is not (H1 supported; H2 not supported). The second-step model indicates a significant interaction between p_proximate and p_distal on news credibility perceptions.

In order to examine direction of the interaction effect, a follow-up analysis was conducted using MODPROB, the moderation probing script for examining interactions between continuous variables (RQ1).²⁷ Figure 1, showing the slopes of p_distal when the p_proximate is
at $M$ and $M \pm 1 SD$ indicates that perceived distal source credibility significantly predicts news credibility perceptions when individuals perceived the proximate source as highly credible (at $M+1SD = 5.07$). However, this positive association between perceived distal source credibility and news credibility perceptions was not found when the proximate source was not perceived as highly credible. When proximate source credibility was perceived about average or lower than the average, news credibility score tends to be low (i.e., less than around 4.2) regardless how distal source credibility was rated.

The second set of hierarchical regression tests was conducted to explore if source-credibility perceptions of proximate and distal source cues have different effects on perceived news credibility as a function of message involvement (H3, H3a and b). The first model indicates that not only p_proximate but also d_involvement positively predicted news credibility perceptions. The second step model reveals a significant interaction between p_proximate and p_distal on news credibility. The third step found a significant three-way interaction of p_proximate, p_distal, and d_involvement (H3 supported; see Table 2).

For participants in the high involvement condition, there was a significant interaction between p_proximate and p_distal on news credibility perceptions. For those who rated high on p_proximate, p_distal was a positive predictor of perceived news credibility, whereas perceived news credibility ratings of those who rated low on p_proximate was not influenced by p_distal (H3a supported). For low-involvement participants, however, the interaction between p_proximate and p_distal on the dependent variable was not found. Only p_proximate positively
predicted news credibility perceptions, whereas $p_{\text{distal}}$ was not a significant predictor (H3b supported).

As follow-up analyses, conditional effects of $p_{\text{distal}}$ on news credibility evaluation at values of $p_{\text{proximate}}$ in each involvement condition were explored.$^{30}$

Figure 2 suggests that, in the high involvement condition, perceived distal source credibility significantly influences participants’ news credibility perceptions only when the perceived proximate source credibility is high (i.e., $M+1SD = 5.08$). When perceived proximate source credibility is about average or lower than the mean, news credibility score tends to be rated low (i.e., less than around 4.3) regardless of the perceived distal source credibility. In other words, for individuals who have high involvement with the news, even a single source cue perceived as having low credibility would lower news credibility perceptions regardless of credibility perceptions of other source cues. On the other hand, Figure 3 suggests that for individuals with low involvement in the topic of the news story, only credibility perception of the most proximal cue matters for news credibility evaluation.

**Discussion**

The study showed that when individuals are highly involved, they tend to scrutinize the credibility of both proximal and distal sources. Even a single low-credibility source in a sequence of multiple source cues can negatively impact perceived news credibility. However, for those with low involvement, only the most proximate source mattered.
However, it is possible that the congruency of source cues may have interacted with perceived source credibility. Participants may well have perceived congruency between two source cues attached to a news story when they read it on Google News and originally sourced to *The New York Times*, whereas they may have perceived incongruency if the news came from *National Enquirer*. According to the sufficiency principle of HSM, perceived inconsistency among message components may lead the reader to scrutinize the message more carefully. In order to investigate this possibility, a follow-up analysis was conducted, but failed to show any effects for congruency.

While consistency of sources may not matter, relative credibility and position of each source (in a chain of sources) does seem to have a strong effect on perceived credibility of news stories. A notable finding of the current study is that the perceived credibility of the news media carries over to perceived portal site credibility, but the reverse is not true. In fact, a mediation analysis using 5000-sample bootstrapping showed a significant mediation of portal credibility for the relationship between news media and news credibility. Once portal credibility was entered, the direct effect between news media and news credibility became insignificant, suggesting full mediation by portal credibility.

This carryover effect implies a hierarchy among various sources, thus providing psychological verification for the concept of “source layering” and empirical evidence for the concept of “credibility transfer,” which suggests that credibility attributed to a single level of source tends to be influenced by credibility references at other levels. More fundamentally, it suggests that online news receivers make distinctions between news media and portal site as sources, and that their credibility ratings of stories attributed to these sources are contingent upon personal involvement with topic of the news story.
Theoretical Implications. This study found evidence suggesting relative heuristic values of source cues based on perceived psychological distance. The more proximate the source cue, the greater its influence on perceived credibility of the message. This finding is consistent with the results of previous studies in the “Computer As a Social Actor” (CASA) paradigm. Because the source cue of a portal site, which is inanimate, is more proximate than that of a news media in the context of online news consumption, individuals may believe that the portal site is the news source when they do not need to put extra cognitive effort into evaluating the news source. More broadly, our findings suggest that in the presence of multiple source layers, which are quite common on the Internet, the most salient or proximate source is going to exert greater influence on readers’ content judgments than other source cues on the interface.

Moreover, the findings support HSM’s hypothesis on the co-occurrence of systematic and heuristic processing. The results suggest that even individuals who have high involvement in a news topic are influenced by source credibility, which is commonly considered a heuristic cue. In fact, those who are highly involved in the news topic are more likely to systematically process source credibility indicated by all available source cues. Overall, this study adds to our understanding of how dual-process models operate in the context of online news processing, by showing that contextual variations of heuristic cues (specifically, spatial differences of cues in the news chain) can critically determine how those cues are processed by users.

The results also speak to the contingent nature of online source credibility. Traditionally, source credibility has been regarded as socially shared perceptions of a source, which is related to its accumulated reputation. In this study, however, the perceived credibility of a portal site was partially contingent upon the credibility of the news media that originally produced the news story. More importantly, participants’ evaluation of news credibility was not influenced by
manipulated source credibility but by the level of perceived source credibility. On the one hand, this phenomenon could be due to the lack of accumulated and socially shared opinions of portal websites, quite unlike traditional media outlets, such as newspapers and television channels. On the other hand, this could be due to the perceived functional difference between news portal websites and news media. In other words, online news users may consider the newsbot as a technology that simply aggregates news and delivers it to readers without being involved in controlling the quality of the news stories. That responsibility rests with the news media supplying the content to portals. This could explain why the credibility of the news media carried over to the portal site’s credibility whereas portal site credibility did not carry over to news media credibility. These trends in the data have implications for theories that frame how individuals seek and process information from various media available. For instance, based on uses and gratification approach, a study found that individuals tend to use multiple “repertoires” of channels to meet their own needs from information seeking, rather than simply rely on a single channel.\(^3\) Also, information foraging theory, which primarily focuses on online information seeking behaviors, suggests that online users’ patterns of information consumption are influenced by the information scent from cues embedded in the immediate environment about distal information.\(^4\) The goal of such information seeking strategies is to maximize the benefit of obtaining valuable information with minimum effort by allocating one’s attention efficiently. Our results suggest that source cues attached to a news story emit information scent about the credibility of the underlying story and thereby help readers choose channels and seek information strategically.

**Practical Implications.** Based on the carryover effect from news media’s credibility to portal site’s credibility, we recommend that the algorithms of these portals include source-based
distinctions when selecting material to publish on their sites, instead of simply scouring the Web for the latest information and breaking news. When publishing the resulting stories, portals ought to clearly identify the original news media source on the interface.

The results of the study also have implications for economic accountability and legal responsibility of information that is seamlessly transmitted via various types of information vehicles that exist in the online media environment. Even though online news aggregators tend to reap the financial rewards of news dissemination to audiences, they tend to share none of the legal burdens. Our findings offer a psychological basis for determining their share of ad revenues and other profits accruing from dissemination of news stories, especially in relation to the share enjoyed by news aggregators who are often responsible for distribution of online news. Given that our study shows that online news portals are quite influential in readers’ news evaluations, it is time that judges and juries consider naming these portals in defamation cases and other lawsuits where assigning culpability to perceived news source is legally important.

All these applications of our findings should consider the study’s limitation of using a sample of undergraduate students majoring in communications, who are likely to have higher media literacy than laypersons trained in other fields. While it may well be argued that ours is a conservative test for blind transfer of credibility from news media to portal sites, it must be acknowledged that many news receivers may not even be aware of credibility differences across different news sources. Future research with broader samples can help alleviate this concern.

In conclusion, this study provides empirical evidence for effects of source-layering in online information contexts by showing that distal sources influence proximate source credibility. Source is a psychologically important cue, relied upon by individuals to make judgments of information quality in an increasingly cluttered online-media landscape. Therefore, the manner
in which specific sources are portrayed on the interface and the degree to which they are made salient and proximate can be quite critical in shaping user perceptions of online media content.

Acknowledgement

This research was supported by the Korea Science and Engineering Foundation under the WCU (World Class University) program funded by the Ministry of Education, Science and Technology, S. Korea (Grant No. R31-2008-000-10062-0).
NOTES:


7. Sundar and Nass, "Conceptualizing Sources in Online News."

9. Gunther, "Attitude Extremity and Trust in Media."


22. Length of both news stories was almost the same. Other news cues, such as size and location of logos, site layout, authors’ names, the times the stories were posted, and the dateline, were identical across conditions.


26. Jacob Cohen, Patricia Cohen, Stephen G. West, and Leona S. Aiken, *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences* (Hillsdale, New Jersey: Lawrence Erlbaum Associates, 2003); In the first set of tests, perceived portal site credibility (p_proximate), perceived news media credibility (p_distal) and the interaction product between p_proximate and p_distal were included in the model as potential predictors of news credibility perceptions (H1, H2 and RQ1). In the first step of the analysis, p_proximate and p_distal scores were entered; as a second step, the interaction term of p_proximate and p_distal was added to the model.


28. M refers to ‘mean’ and SD refers to ‘standard deviation.’ The post hoc analyses and graphs demonstrate the effect of perceived news media credibility on perceived news credibility at three different points (M-SD, M, and M+SD) of perceived portal credibility.

29. In the first step analysis, p_proximate, p_distal, and dummy-coded involvement (d_involvement; High=1 and Low=0) were included, then two-way interaction products of these three variables (i.e., p_proximate x d_involvement, p_distal x d_involvement, and p_proximate x p_distal) were added in the second step. Lastly, a three-way interaction product of the three variables (i.e., p_proximate x p_distal x d_involvement) was included in the third step.

30. For those analyses, three values (i.e., M-1SD, M, M+1SD) of perceived proximate source credibility were entered in the model, which contain three predictors, perceived proximate source credibility, perceived distal source credibility, and interaction term of those two variables.
The analyses were conducted separately with two subgroups, high and low involvement conditions, using MODPROB.

31. ‘Source cue congruency’ variable was generated by recoding source cue combinations of Google (High) - The New York Times (High) and Drudge Report (Low) - National Enquirer (Low) as ‘congruent (1)’; Google (High) - National Enquirer (Low) and Drudge Report (Low) – The New York Times (High) as ‘incongruent (2).’ The main effect term for congruency and the interaction products of congruency and perceived proximate and distal source credibility were entered into the models, with perceived news credibility as the dependent variable.

32. Perceived proximate source credibility (p_proximate), perceived distal source credibility (p_distal), congruency, and possible two-way and three-way interaction products generated by combining the three variables were entered in the model (congruency X p_portal, congruency X p_portal, p_proximate X p_distal, and congruency X p_proximate X p_distal), but none of them were significant predictors of perceived news credibility (congruency: \( p = .63 \); congruency X p_portal: \( p = .49 \); congruency X p_distal: \( p = .08 \); congruency X p_proximate X p_distal: \( p = .14 \)).


34. Statistical significance of the mediation effects was determined based on 95% bias-corrected and accelerated bootstrap confidence; Involvement was entered as a covariate. Indirect effect: \( B = .05, SE = .02, 95\% \text{ CI } [0.02, 0.10] \); Direct effect: \( B = .03, SE = .03 \quad p = .32 \); Total Effect: \( B = .08, SE = .03, p < .05 \).

36. Sundar and Nass, "Conceptualizing Sources in Online News."


**Table 1. Model 1: Predictors of news credibility perceptions \((N = 231)\)**

<table>
<thead>
<tr>
<th>Step</th>
<th>B</th>
<th>(R_{adj}^2)</th>
<th>(\Delta R_{adj}^2)</th>
<th>(F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p_proximate</td>
<td>.10</td>
<td>.30***</td>
<td></td>
<td>12.87***</td>
</tr>
<tr>
<td>p_distal</td>
<td>.01</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p_proximate X p_distal</td>
<td>.13</td>
<td>.03</td>
<td></td>
<td>11.31***</td>
</tr>
</tbody>
</table>

*Note.* p_proximate- perceived portal credibility, p_distal- perceived news media credibility. p_proximate and p_distal were mean-centered.

** p < .01, *** p < .001
Table 2. Model 2: Predictors of news credibility perceptions ($N = 231$)

<table>
<thead>
<tr>
<th>Step</th>
<th>B</th>
<th>$R_{adj}^2$</th>
<th>$\Delta R_{adj}^2$</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p_proximate</td>
<td>.25</td>
<td>.32***</td>
<td>.25 - .25 .71***</td>
<td>F</td>
</tr>
<tr>
<td>p_distal</td>
<td>.03</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d_involvement</td>
<td>.66***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2:</td>
<td></td>
<td></td>
<td>.03 .03 .28 .28 .03</td>
<td>15.71***</td>
</tr>
<tr>
<td>p_proximate X d_involvement</td>
<td>-.12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p_distal X d_involvement</td>
<td>.11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p_proximate X p_distal</td>
<td>.10**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 3:</td>
<td></td>
<td></td>
<td>.02 .02 .30 .30 .02</td>
<td>14.89***</td>
</tr>
<tr>
<td>p_proximate X p_distal X d_involvement</td>
<td>.18**</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note.** p_proximate- perceived portal credibility, p_distal- perceived news media credibility, d_involvement: dummy coded involvement conditions (high vs. low). Involvement conditions was coded as High = 1, Low = 0. Higher scores on perceived portal site and news media credibility indicate more positive credibility perceptions. p_proximate and p_distal were mean-centered. **p < .01, ***p < .001
Figure 1. Interaction between the perceived proximate source (portal site) credibility and the perceived distal source (news media) credibility on news credibility.

Conditional Effect of Focal Predictor at Values of the Moderator Variable (N = 231)

<table>
<thead>
<tr>
<th>Perceived Portal Credibility</th>
<th>B</th>
<th>SE</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.33 (M-1SD)</td>
<td>-.07</td>
<td>.048</td>
<td>-1.57</td>
</tr>
<tr>
<td>4.20 (M)</td>
<td>.01</td>
<td>.036</td>
<td>.26</td>
</tr>
<tr>
<td>5.07 (M+1SD)</td>
<td>.09*</td>
<td>.047</td>
<td>1.99</td>
</tr>
</tbody>
</table>

*p < .05
Figure 2. Interaction between the perceived proximate source (portal site) credibility and the perceived distal source (news media) credibility on news credibility in the high involvement condition.

<table>
<thead>
<tr>
<th>Perceived Portal Credibility</th>
<th>B</th>
<th>SE</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.19 (M-1SD)</td>
<td>-.09</td>
<td>.06</td>
<td>-1.39</td>
</tr>
<tr>
<td>4.13 (M)</td>
<td>.07</td>
<td>.05</td>
<td>1.59</td>
</tr>
<tr>
<td>5.08 (M+1SD)</td>
<td>.23***</td>
<td>.06</td>
<td>3.86</td>
</tr>
</tbody>
</table>

*** p < .001
Figure 3. Interaction between the perceived proximate source (portal site) credibility and the perceived distal source (news media) credibility on news credibility in the low involvement condition.

Conditional Effect of Focal Predictor at Values of the Moderator Variable \((N = 231)\)

<table>
<thead>
<tr>
<th>Perceived Portal Credibility</th>
<th>B</th>
<th>SE</th>
<th>(t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.49 (M-1SD)</td>
<td>-.02</td>
<td>.06</td>
<td>-.34</td>
</tr>
<tr>
<td>4.27 (M)</td>
<td>.03</td>
<td>.04</td>
<td>-.56</td>
</tr>
<tr>
<td>5.05 (M+1SD)</td>
<td>.03</td>
<td>.06</td>
<td>-.51</td>
</tr>
</tbody>
</table>
Appendix 1. Stimulus Materials

1. High Portal Credibility, High News Media Credibility, & High Involvement

State universities eye 5 percent down in tuition

By Michael Abramowitz
The New York Times Staff Writer
Tuesday, April 4, 2009; 8:33 PM

PHILADELPHIA, April 4—Some state universities in Eastern U.S. have unveiled its plan to slash tuition by 5 percent on average from the fall semester in 2009.

Chief Financial Officer Bob Sheekhowitz of Penn State proposed a 5 percent decrease in tuition to its board of trustees Friday in consideration of the slowing local and national economy.

“I am glad that I was able to propose the tuition cut,” Sheekhowitz at Penn State said in presenting the decrease. “The plan was approved by the planned congressional support.” According to the Chronicle of Higher Education, Penn State will receive $16.9 million from the state this year.

During the meeting, however, Board Chairman Joe Murphy proposed a 5 percent reduction, saying a 5 percent cut might not be desirable as there are expected rises in expenses for renovating facilities, recruiting and retaining “excellent” faculty, and ensuring academic quality.

The renovation of dormitories is planned with the revenue increase, at an estimated cost of $100,000 according to Murphy. An upgrade of sporting goods at on-campus gyms is also planned, at an estimated cost of $6,000 to be spent purchasing new equipment.

After a hearing next week the board of Penn State is expected to reach a decision before the end of April. Once a decision is made, tuition rates will be guaranteed for four years under the state’s tuition guarantee law, designed to give families predictability in college costs.
2. Low Portal Credibility, Low News Credibility, & Low Involvement

Fed offers online maps showing “foreclosure hotspots”

By Michael Abenowitz
The National Enquirer Staff Writer
Tuesday, April 4, 2008, 9:13 PM

PHILADELPHIA, April 4... The Federal Reserve System on Friday said it was offering online maps that illustrate subprime and near-prime mortgage loan conditions across the United States, and show “existing and potential foreclosure hotspots”.


“This may assist community groups which can mobilize resources to bring financial counseling and other resources to at-risk homeowners,” the Fed said in a statement.

Policymakers can also use the maps and data to develop plans to lessen the direct and spillover impacts that delinquencies and foreclosures may have on local economies.

The maps allow Internet users to search state, counties and most zip codes for information such as foreclosures per 1,000 housing units, share of loans that are more than 90 days past due, the share of adjustable rate mortgages with an initial reset in the next 12 months and share of loans with low credit scores or high loan-to-value ratios.

The current state of economic turbulence has been credited with causing domestic consumers to fall behind on car, credit card and home-equity loans at the highest level since 1990, a year after a U.S. recession ended. Everyday more than 4,500 people call Hope Now, the White House-backed group formed to help struggling homeowners.

But few of them appear to be getting the relief they are hoping for. One reason is that the financial powers behind Hope Now — mortgage lenders, loan servicers and big investors — are reluctant to change loan terms substantially if doing so hurts them. Almost six months after Hope Now was created, the group is largely resisting calls for broad relief for homeowners.