

IS SEEING BELIEVING? THE EFFECTS OF DOCUMENTCLOUD
LINKS ON PERCEPTIONS OF CREDIBILITY OF NEWS ARTICLES

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ABSTRACT

News media consumption is migrating online, cutting into the business model of traditional news media at a time it has continued to struggle to reverse a decades-long drop in its perceived credibility among consumers.

DocumentCloud was created to help news media publish and annotate source materials online as a supplement for online articles. This research studied whether DocumentCloud could boost credibility perceptions among online consumers of news media, and, if so, with what type of message. It theorized that the mere presence of links would boost credibility perceptions of the accompanying articles.

Three different groups of subjects were tested for effects: a control group, those shown links with a basic message, and those shown links with an educational message. Building upon research in credibility, cognitive processing, and media literacy, this study found slight improvements in credibility perceptions when subjects were shown an educational message with the links, with more pronounced effects seen among subjects who had less formal education.

Introduction

Among the woes of traditional news media have been two seemingly unrelated phenomena: people continue to lose trust in traditional news media, and the Internet has forced the traditional news media to rethink its business model.

On the front lines of both sides of the equation are local newspapers. On the trust side, newsrooms have been grimacing for decades at the regular reports from the Pew Center that show drop after drop in surveys of believability, plummeting from 80 percent of respondents who rate their local newspapers as believable in 1985 to 52 percent by 2012 (Pew, 2012). That drop mirrors one in a separate survey that asks respondents on the confidence they have in various government and private institutions. The percentage of those having a high level of confidence in the press has fallen from a high of 28 percent in 1976 to under 10 percent by 1998, where it has hovered since (Smith and Son, 2013). Newspaper journalists historically tied drops in circulation to the drop in credibility, until the blossoming of the Internet allowed audiences far more media choices, and the Internet became the new boogeyman (Doherty, 2005).

The focus of the media conversation changed as the news audience migrated online, first with desktop computers and now with portable devices. As of 2012, a majority of tablet and smartphone users have used the devices to access news (Mitchell, A., Rosenstiel, T. & Christian, L., 2012). While pleased news consumers haven't checked out entirely, the move has been bittersweet for media producers, particularly

newspapers, because online ad revenue is much smaller than what traditional print ads used to bring in, helping fuel staff cutbacks in newspapers of 30 percent since 2000 (Edmonds, Guskin, Jurkowitz, and Mitchell, 2013).

As consumers have migrated online, media producers have tried to capture more circulation revenue, with paywalls erected at many mainstream newspaper sites. At the same time, media producers have tried to create a better online product, adopting to varying degrees the idea of convergence, or combining print, audio, and video into online presentations. (Huang, 2007) It has presented a new challenge for traditional media: Find a way to charge for online content that used to be free, hopefully by taking advantage of the possibilities of an improved product free of the constraints of paper and ink.

With the migration from print to the web, there are more opportunities to help present the information in different, more engaging ways. Online news offerings have evolved to include more interactive features, most notably hyperlinks to other stories with related content (Barnhurst, 2012). One of the most successful innovations has been a project called DocumentCloud. The project was conceived in 2008 as a way to allow any media outlet to upload source documents online, make them text-searchable, annotate them, and provide easy access to readers (Seward, 2008). With \$1 million in initial grants from the Knight News Challenge, DocumentCloud developed a platform that became popular with newsrooms across the country while merging with the long-established reporters' group Investigative Reporters and Editors. (Garber, 2011) By

2014, the site had more than 5 million pages of primary source documents that had been viewed more than 60 million times (DocumentCloud, 2014).

Much of the communication research involving news convergence has focused on what traditional media are doing to change, or whether consumers are buying it – through theories such as diffusion of innovation and uses and gratifications. But there has been less research that could explain and predict the effects of this evolving model of news convergence on the attitudes of news media consumers – and those effects on consumers could ultimately be the driver for understanding how news media organizations can change their products to improve audience attitudes and, potentially, the organizations' bottom lines.

Some of those answers could be found in the reignited research into news media credibility. That credibility research can be traced to the 1930s but gained steam after the Roper polling organization began surveying the relative believability of different media, with differing results from 1959 to 1961 that suggested television was more trusted than newspapers (Gaziano and McGrath, 1986). Researchers spent the next two decades honing just how to define credibility, but not necessarily offering reasons what was happening in the minds of readers as they perceived "credibility."

Separately, during the last 60 years, psychological theories were developed to explain and predict how credibility is assessed, as far back as Herbert Simon's 1955 theory of bounded rationality, in which people cannot always act perfectly due to limitations of external factors, such as time, and simply being human (Metzger, Flanagin

and Medders, 2010). This approach evolved in the 1980s into two commonly cited, and similar, dual-processing models of credibility assessments -- both of which suggest some judgment can be based on focused effort to sort through evidence while other judgment can be based on cues not given serious thought. One theory is the elaboration-likelihood model, developed by Petty and Cacioppo (Sundar, 2008), in which information can either be evaluated more cognitively through a central route into attitude formation, versus cues that may lead to judgments through a peripheral route. The other theory is the heuristic-systematic model, developed by Chaiken and Eagly (Sundar, 2008), in which systemic processing occurs for subjects deemed relevant while heuristic cues are used as short-cuts to make quick, efficient judgments on less-relevant material (Sundar, 2008). Researchers have since elaborated on those theories for their effects in an online world, drilling down to how the unique aspects of digital media can affect credibility assessments, with one arm of this research turning to better understand the intersection of online news credibility and the dual-processing information theories – helping to link back to the research on traditional media credibility.

Research has looked at several specific ways the information theories can explain differences in credibility perceptions beyond information quality. Studies have focused on website layouts and add-ons that can be packaged with articles, such as biographies on the author and links to source documents. But no research has looked at the specific effects of DocumentCloud on perceived credibility – even as DocumentCloud becomes increasingly popular with traditional newspapers online.

Separately, scholars have studied news media literacy, an offshoot of media literacy studies that became popular in the twentieth century. Even as an offshoot of media literacy, news media literacy itself offers broad avenues of research, from an educational focus on teaching people how best to utilize the technical aspects of news media products to informing people on how potentially corrupting influences of news media producers affect the media messages offered. Within that framework, however, there has not been research that looks at whether a media literacy message focusing on journalists' efforts to gather news can affect perceptions of that message's credibility.

Research problem

This study tested the effect of DocumentCloud links to online news articles on levels of credibility reported by online news consumers. This paper studies the effects of this element guided by the heuristic-systematic model, as well as being informed in part by research in news media literacy.

The first three hypotheses test these effects through different aspects of the heuristic-systematic model.

H1: Online articles with a side box that advertises links to source documents will be more credible than online articles that do not have such side boxes. This effect was tested through the model's proposition that a heuristic cue – in this case the mere advertisement of a link – can trigger a more positive assessment of credibility, regardless of whether a link is clicked.

H2: Online articles in which consumers click on hyperlinks of source documents will be more credible than online articles in which users do not click on hyperlinks of source documents. This was tested through the model's proposition of an additivity effect of systematic processing enhancing a more positive assessment of credibility, which in this case was expected to be the clicking of a link to review source documents that triggers systematic processing beyond the heuristic cue triggered from merely seeing the link.

H3: Consumers who feel more personal involvement in a story will be more likely to click on hyperlinks than those with less personal involvement. This tested the model's proposition of the sufficiency principle, which indicates systematic processing is triggered when someone's desired confidence in information is higher than their perceived level of confidence in the information. The model suggests that personal involvement boosts desired confidence. So in this case a subject who feels personal involvement was expected to have a high desired level of confidence, triggering a desire to click on hyperlinks to engage in systematic processing to reach that desired level of confidence.

The final two hypotheses tested the effects of the links through both the heuristic-systematic model's sufficiency principle as it's informed by media literacy:

H4: Online articles with a side box that educates consumers on the importance of verifying stories through source documents are more likely to have their hyperlinks clicked than online articles with side boxes that do not contain such an educational

message. This tested whether a media literacy message extolling the virtues of having high confidence in information will, in fact, trigger that higher level of desired confidence called for in the sufficiency principle in order to trigger systematic processing, which in this research was measured by subjects clicking on links.

H5: Among subjects given the option to click on hyperlinks, consumers younger than 35 will be less likely to click on hyperlinks from boxes without an educational message than consumers 35 and older. A slight off-shoot of H4, this tested whether a media literacy message extolling the virtues of having high confidence in information is more important for younger subjects than older subjects in triggering that higher level of desired confidence called for in the sufficiency principle in order to trigger systematic processing, which in this research was measured by subjects clicking on links.

Explication of concepts

The independent variable of DocumentCloud display was defined as one of two types of boxes that were displayed beside condensed versions of articles that recently won the Pulitzer Prize for investigative reporting and used DocumentCloud to display and annotate source documents. Each box for each story was roughly the same size and appeared in the same area of the online presentation. Each story had three hyperlinks linking to actual source documents for the story posted in DocumentCloud. Descriptions of the linked documents were nearly identical, except for editing to ensure the boxes were the same size. One set of boxes offered a simple message that noted subjects can see the source documents, with hyperlinks to them, while another set of boxes

contained a news media literacy message on the importance of vetting source documents to ensure accurate reporting, along with the same links.

The dependent variable of credibility was defined as the scores of survey participants of questions that asked them to rate various aspects of credibility, including believability, accuracy, trustworthiness, bias, and completeness in questions measured on a 7-point scale that ranged from strongly agree to strongly disagree.

Literature Review

This study tested the impact of DocumentCloud links to online news articles on levels of credibility reported by online news consumers. The study focused on the effects of this process through the lens of the Heuristic-Systematic Model, known by its initials HSM, and within the context of subjects' media literacy. HSM suggests that people use two different paths to cognitively arrive at credibility assessments. The first path, perhaps the one that many people would expect, is through a systematic processing, or a detailed analytical considering of information relevant for judgments (Briñol & Petty, 2012). An example would be someone assessing a flyer advertising a new car by studying the detailed list of attributes, perhaps pouring through things like interior features or gas mileage. The second path, the one less understood by laymen, is heuristic processing. Heuristics – or mental shortcuts to making judgments – are pre-programmed over years of experience to save the brain from thinking too hard about things on which it would rather not expend so much effort. Heuristics can be conscious or subconscious (Sundar, 2008). The heuristics can be triggered by cues such as article lengths – such as a heuristic believing longer articles are more credible – to cues based solely on sources – such as a heuristic that experts can be trusted. In essence, the brain, looking to save effort, scans for cues, often subconsciously, in a message in order to avoid the heavy lifting of pouring through a message itself to assess credibility. For an example, consider the same car ad, except it also having an attractive model standing next to the car. Sundar (2008) notes that such a cue – seeing an attractive model – can

trigger a positive, albeit loose association with the persuasive message itself. But heuristics aren't limited to pretty things. Studies have shown a bevy of possibilities, including a bandwagon heuristic that boosts perceived credibility of online articles that advertise higher numbers of recommendations from past readers than those that don't (Xu, 2013). The model is similar to another of the so-called dual-processing models: Elaboration Likelihood Model, or ELM. The ELM also suggests two distinct different paths – calling one central (that compares to systematic) and the other peripheral (that compares to heuristic).

What made the HSM more attractive than ELM for this study is its focus on when the different types of processes are triggered. Just what route is taken is influenced by the sufficiency threshold, defined as the following: If the level of desired confidence in a thought is higher than the confidence one has in his or her attitude, the person is more likely to engage systematic thought. But when someone's desired confidence in a thought is equal or lower than the assumed confidence in an attitude, heuristics are more likely to be used (Petty and Bristol, 2012). In other words, if someone doesn't care so much about whether a specific media message is credible, that person won't put much effort into figuring it out, instead relying more on heuristics. If a healthy person is reading an article about a new cancer drug, the article could be judged mostly on heuristics – unless the reader happens to have a loved one who could benefit from the drug, or the reader is desperately searching for a cure for his or her own cancer. In the case of a healthy person with no life-or-death stake in cancer research, he or she would be considered to have low motivation, or have little direct motivation in assessing the

credibility of the article. The articles chosen for this study were tailored to be low-motivation messages in which HSM should have helped explain expected reactions to the first and second hypotheses. HSM was expected to explain reactions to the first hypothesis because HSM and similar dual-processing models predict that low-motivation messages will process information using heuristic, versus systematic, methods, as Metzger (2007) explained:

In other words, when people are motivated due to personal or situational factors such as having a high need for accurate information or having a personal stake in understanding some issue, they are likely to pay more attention to a message, think about the arguments presented, and exert more cognitive resources to process and evaluate the information and its source. By contrast, when motivation and/or ability are low, these models predict that information will be processed or evaluated based on more superficial and less thoughtful criteria. In these situations, decisions will be made on more heuristic judgments of the message or its source (e.g., attractiveness) rather than on message quality. (pg. 2087)

This model was expected to help explain findings in the second hypothesis based on HSM's theories on the interplay between heuristic and systematic processing. HSM posits that both types of process can occur simultaneously, with at least three possibilities (Todorov, Chaiken & Henderson, 2002). The first, additivity, suggests that cues that produce consistent attitudes either through heuristic or systematic processing

will trigger a stronger influence on attitude formation than cues processed individually. The second, attenuation, looks at the opposite possibility: attitudes in conflict from different cues or processing, such as a case where a speaker perceived as highly credible makes an argument with lame evidence. Attenuation suggests that systematic processing tends to kick in and attenuate the original heuristic. The third, bias, looks at what its developers suggest is more real-world situations, in which messages with ambiguous evidence are pushed by sources with varying levels of source credibility. It suggests that the bias produced from the heuristic triggered by the source cue will carry over into how the message itself is judged. In this thesis, H2 suggested that, in line with the additivity hypothesis of HSM, a study participant's clicking on and, presumably, perusing a source document to trigger more systematic processing, would only enhance positive attitude formation, beyond the heuristic produced from seeing that a link can be clicked. And, to better understand the motivation for clicking on links, this study's third hypothesis measured for the presence of the sufficiency principle, which under the model suggests that those with a more personal connection to a topic will employ more systematic processing than those with less of a personal connection.

HSM does have limitations. It does not offer insight into which heuristics, or even how many, may be at play as subjects make credibility assessments. Additional studies have helped offer dozens of examples of possible heuristic cues, but researchers note such a list is likely woefully inadequate to describe all the heuristics at play, and even then would not help explain individual variations in heuristics. HSM also does not help explain why certain heuristics may have a greater impact on credibility assessments as

others (Hyunjin, Keunmin, Shaoke & Sundar, 2011). For example, HSM would not explain whether using a larger box in this thesis to tout source documents would have led to an increased heuristic effect on a credibility assessment.

This study attempted to fill in some of that void by offering subjects a media literacy message, through the fourth hypothesis based on prior research into news media literacy, a two-decade-old offshoot of the media literacy movement with roots in the early twentieth century. One measure of news media literacy adopts a definition of news processing similar to HSM's dual routes of processing information, with a suggestion that news media literacy is higher among those who focus more strongly on current events and civic engagement, a demographic that other research has found is higher among older citizens, offering a tie in to this study's fifth hypothesis that had the potential to offer greater insight into HSM's relationship to news processing.

HSM's dual-processing model has been considered among the biggest advancements in persuasion research, which itself has theories that date back nearly to the dawn of recorded thought and have evolved, and grown more complex, as communication delivery options have also evolved and grown more complex.

History of Credibility Research

Scholars initially focused on credibility of either sources or messages, amid an atmosphere of one-way communication from established gatekeeper to audience. But as the gates have been lowered, research has turned to multi-dimensional reviews that acknowledge the increasingly blurred lines regarding the facets of credibility, the ways

audiences receive evidence of those facets, and the efforts made by the audience to process that evidence to arrive at perceptions of credibility, through broader persuasion research.

Theories on credibility can be traced at least to Aristotle, who wrote that persuasion is effected by ethos, pathos and logos. Ethos is the reputation of the persuader, mirroring questions of source credibility. Pathos is the reaction of the audience to the subject, lending to questions of audience response to a message. And Logos is the arguments that can be made, similar to questions today on message credibility (Cockcroft, 2004) (Roberts, 2010). In comparison to more modern credibility definitions, the concept of logos could be studied through questions of message credibility, ethos through source credibility, and pathos through social psychological theories of audience reaction to message cues.

Those more modern constructs of credibility came as the delivery methods for messages changed, along with the stakes for perceived credibility. Far from the basic speeches of Aristotle's time, people of the twentieth century had a multitude of ways to get messages, get them as part of bigger audience groups, and get them faster. The printing press had been honed to offer not only pamphlets and books, but magazines and daily newspapers circulated on a wide scale. Radio offered immediate, one-way verbal conversations across the country, while pre-recorded movies added visual elements to the mix of ways to convey messages. At the same time, the developed world's governments were locked in wars for global supremacy. And after the United

States Army watched Hitler sway masses of German citizens with propaganda movies, it pushed its own research during World War II to determine, among other things, how best to use messages to persuade people. Enter Carl Hovland, who led colleagues in the first large-scale, systematic experiments of attitude change by studying the level of persuasiveness of various U.S. Army morale and training movies. (Petty, Ostrom & Brock, 1981) Those studies spawned the Attitude Change and Communication Research Project at Yale, where Hovland and colleagues further studied persuasion, with Briñol and Petty (2012) calling Hovland “arguably the single person most responsible for establishing attitude change as a dominant topic in social psychology and beyond.” (286) He and his colleagues’ research in the early 1950s touched on the specific attitude formation of credibility, and their research helped develop the traditional definition of credibility as the believability of information, based largely on the perceived trustworthiness and perceived expertise of the message or source of the information (Metzger & Flanagin, 2011).

Media credibility

While the national-security reasons for credibility research may have faded after World War II, the commercial reasons for a specific subset of credibility research – media credibility – only grew as radio and TV battled with newspapers over who best could profit from spreading news to the masses, with the belief that objectivity would enhance, or at least be a reflection of, news consumption.

By the twentieth century, the concept of objectivity was relatively new in journalism. Ladd (2012) traced the seeds of American traditional mass media to newspapers in the 1700s that catered more to the elites and operated under threats of censorship or fueled by patronage from those in power. The censorship began to wane with the Revolutionary War, as some newspapers played a defining role in rousing up defiance of the crown, with that leading many Revolutionary leaders to later champion the concept of a free press embodied in the First Amendment. But that freedom from censorship did not translate into objectivity, as most newspapers became arms of political parties or movements, offering the kind of rhetoric that could shock even the most hardened of commentators today. One example is the type of words slung around over George Washington. In one newspaper, he was called “a traitor, a robber, and a perjurer.” (Blumberg, 2010) And in his 1947 book *The Presidents and the Press* (as quoted in Ladd, 2012), James Pollard found that a newspaper run by Benjamin Franklin’s grandson called Washington “treacherous” and “mischievous,” and also accused him of “pusillanimous neglect” and “spurious fame.” Washington responded to such criticism by claiming such newspapers were “void of truth and fairness.” Ladd (2012) wrote that it is impossible to tell just what other Americans thought of media credibility at the time, or as they transitioned in the nineteenth century to more sensationalism and “independent” viewpoints typically of their editors or publishers amid the creation of a more commercial press. But Ladd suspected, even back then, media consumers questioned credibility of media producers:

While the lack of modern opinion polling prevents us from knowing with certainty how the commercial press was viewed by the public, contemporary figures ... frequently belittled or attacked the press and believed the public shared their views. (pg. 53)

By the early 1900s, newspapers had abandoned “rampant factionalism” of the past century for the concept of objectivity, as defined by those in the industry as neutral, unbiased reporting. (Mayo and Leshner, 2000). At the same time, newspapers began pushing for reporters to have college degrees, with colleges beginning to specialize in teaching journalism, all part of a push to take advantage of market and political forces that encouraged greater professionalization in the industry (Ladd, 2012). But as the industry began to sell itself as objective and its reporters as professionals, complaints continued about newspapers’ scruples. As early as the 1930s, academics had begun questioning what readers thought of their newspapers, finding significant numbers of readers who thought their newspapers pandered to advertisers, were too sensational, were not accurate enough and were biased. About the same time, the upstart radio industry, hoping to attract advertisers from newspapers, hired researchers to compare the “trust” of radio with newspapers (Roberts, 2010). The focus soon turned to newspapers-versus-TV – as seen in periodic Roper polls for the Television Information Office on the relative believability of different types of media. In 1959, 32 percent of respondents said they would believe newspapers most, with 29 percent believing television. By 1961, television took the lead – 39 percent to 24 percent – and held it consistently and decisively (Gaziano & McGrath, 1986). More than a dozen

studies or reports followed that operationalized the Roper question as a measure of credibility, offering mixed results depending on how the question was asked. Sometimes whether the news was local or national affected the relative believability of each medium, with newspapers sometimes regaining the lead for local news (Gaziano & McGrath, 1986). Those studies came with the crystallization of the trend of declining newspaper household penetration, with newspaper executives looking for reasons why the public was beginning to abandon newspapers. The loss of credibility became one suspected factor in the loss of circulation (Meyer, 1988).

Amid the conflicting results, researchers began to drill down on how best to define credibility. Gaziano and McGrath (1986) offered 12 factors for credibility, ranging from whether a specific type of media outlet is perceived to be accurate or not, to whether a specific type of media outlet does or does not separate fact and opinion. Meyer (1988) winnowed down the 12-factor scale to five: fairness, bias, trustworthiness, accuracy, and completeness. Beyond helping researchers better measure credibility, it reaffirmed the notion that accuracy played a part in credibility, helping tie back to research on accuracy that dated to the Depression, with work done by Mitchell Charnley. In a 1936 study, Charnley reviewed 1,000 newspaper articles and asked sources of those articles to examine the articles for errors. It found 46 percent of the articles contained errors, classified as incorrect quotations, spellings, names, ages, other numbers, titles, addresses, other locations, time and dates (Porlezza, Maier & Russ-Mohl, 2012). Other studies followed, finding even an even higher percentage of

errors when the definition of inaccuracy was broadened to include not just factual errors but perceived subjective errors, such as using facts out of context.

These related tenets of research – newspaper accuracy and perceived media credibility – helped fuel research by the newspaper industry in the 1980s to better understand what readers thought of the industry. But initial results were mixed. A 1985 survey commissioned by the American Society of Newspaper Editors, performed by Kristin McGrath of MORI Research, found three-fourths of adults questioned the credibility of the news media, with equal questioning of both newspapers and TV. But a separate poll commissioned the next year by Times Mirror offered, to Times Mirror, a different take, declaring no “credibility crisis.” In trying to put both studies in context, Meyer (2009) said both generally had similar data points but argued from opposite sides, making glass-half-full or glass-half-empty conclusions. Since the 1980s, however, there has been little debate about the sinking of the metrics. In 1985, the Times Mirror poll found 80 percent of respondents considered their local newspaper somewhat or mostly believable. By 2000, it had dropped to 61 percent, and by 2012, it was 52 percent. Local TV news dropped nearly as much, from 81 percent for the same measure to 61 percent in 2012 (Pew, 2012).

Along the way, researchers affirmed the conventional wisdom that credibility perceptions meant more than just bragging rights. Since the 1960s, studies suggested correlations between perceptions of credibility and media use, although Rimmer and Weaver (1987) found the extent of this correlation was often weak in actual media use,

while stronger in reported preference of use. Still, Beaudoin and Thorson (2002) found that, even as media has proliferated across medium type and political bent, credibility remained important. In developing a theory based on news as a commodity in the marketplace, they called measures of credibility “the central cog in the determination of news media use.” (pg. 257)

Yet until the twenty-first century, much of traditional research on media credibility looked at source credibility or message credibility – without delving into exactly how the audience cognitively arrived at those perceptions. Researchers focused on measuring the end-result – whether and to what extent credibility was perceived – without looking at the process of how consumers arrived. In essence, the research measured how far the car traveled, without looking under the hood to explain why. With advent of Internet, media credibility research soon began tapping into a long line of social psychological research that focused on the cognitive processing of information presented to arrive at credibility perceptions.

Cognitive dual-process approach

At the same time media credibility researchers were trying to measure what types of media consumers found credible, social psychologists pursued the question of how brains arrived at attitudes. One root of attitude research traces as deep as the famous study by nineteenth and twentieth century Russian physiologist Ivan Pavlov, who found that dogs could be conditioned to have reflective responses to stimuli (Samoilov & Zayas, 2007). That conditioning concept carried into humans, with the 1958

study by Arthur and Carolyn Staats, who found that attitudes about objects could be changed in humans by associating positive or negative terms with those previously neutral objects (Staats & Staats, 1958). That related to a framework of attitude arrival based on learning and motivation, developed years earlier by Yale behaviorist Clark Hull, a mentor of Hovland. For persuasion, the framework took basic learning principles – such as learning how not to touch a hot stove – and applied them to attitude formation (Petty & Brinol, 2012). Conditioning was considered a simpler version of learning framework, in which the guiding principle was that people, if provided the right incentives, could follow steps to learning a message, and be persuaded by it.

But that framework began to be questioned through developing theories that focused more on the reaction within the brain of the person trying to be persuaded. The Theory of Cognitive Dissonance, for example, holds that two elements in a cognitive system are consonant if one would likely follow the other, and dissonant if one likely would not follow the other, such as agreeing with one political candidate's views but voting for his or her opponent. Under dissonant circumstances, there is cognitive pressure to make the two congruent and, because actions can be harder to change than thoughts, people are more likely to change their beliefs to line up with their actions (Festinger & Carlsmith, 1959). Another framework was developed: the cognitive response approach. It looked not only at cognitive dissonance, but also role-playing studies that found that people were more likely to be persuaded by arguments they made themselves, versus were told. Under the cognitive response approach, persuasion occurred not from learning messages or source cues but by what thoughts – positive or

negative – occurred in response to inputs (Petty & Brinol, 2012). This helped explain why an attractive model featured on an advertisement could help sell a product. While the framework became widely accepted, further research, however, showed that the same inputs could have different reactions in different people in different situations, leading to suggestions for models that proposed multiple ways of processing inputs, which in turn led to the development of HSM and ELM.

ELM was described by one its developers, Richard Petty, as a “metatheory” for taking the findings of prior research and theories on how variables could manipulate attitudes and helping explain when and how those findings could apply (Petty & Bristol, 2012). ELM suggests that some persuasion processes operate when the likelihood of thinking is high – a central route to cognition – while other persuasion processes operate when the likelihood of thinking is low – a peripheral route. This was shown in a 1981 study in which college students were asked to evaluate a proposal. A host of things were manipulated in the experiment: the strength of the arguments, the expertise of the sources, and – perhaps most importantly – whether the proposal would affect the students asked to evaluate the proposals. The study found that, when the students would be personally affected, they typically used a central route of cognition and focused more on the strength of the arguments. But when the students would not be personally affected, they typically used a peripheral route of cognition and were swayed more by cues such as perceived source expertise (Petty & Bristol, 2012).

About the same time as ELM was developed, HSM was developed by Shelly Chaiken as part of a dissertation at the University of Massachusetts overseen by Alice Eagley (Petty & Bristol, 2012). Instead of describing the cognitive choice as either a central or peripheral route, HSM describes the two routes as either a detailed (systematic) analytical consideration of information relevant for judgments, or a more superficial scanning of memory for mental shortcuts to judgment rules – or heuristics (Sundar, 2008). As noted previously, heuristics are pre-programmed over years of experience to save the brain from thinking too hard about things it would rather not expend so much effort. Those cues can include regarding lengths – longer articles are more credible – or sources – experts can be trusted. Just what route is taken is influenced by the sufficiency threshold. If the level of desired confidence in a thought is higher than the confidence one has in his or her attitude, the person is more likely to engage systematic thought. But when the person’s desired confidence in a thought is equal or lower than the assumed confidence in an attitude, heuristics are more likely to be used (Petty & Bristol, 2012). Heuristics can be conscious or subconscious as well (Sundar, 2008). The theory has been refined to show that systematic and heuristic processing can work at the same time, with a heuristic having effects even in high-motivation, high systematic processes, particularly if the message itself offers ambiguous qualities of good or bad qualities from which to make a systematic judgment (Chaiken & Maheswaran, 1994).

These dual-processing theories’ foundational premise – that people employ cognition as economically as possible – have been reinforced by research looking at the

more general ways people cognitively process information. Ohman (1979) proposed a model of how the brain processes stimuli that create automatic, orienting responses, such as novel, unexpected, or personally meaningful stimuli. Ohman's model postulated the orienting responses are processed in a channel with limited cognitive resources, with automatic comparison to short-term memory and, if no match is found, put on a de-facto processing back-burner unless the more conscious, controlled part of thought switches on and puts focus on the orienting response (Ravaja, 2004). Later, a theory developed called limited capacity model of motivated mediated message processing, or LC4MP. At its core it has two basic assumptions that help reinforce dual-processing theories of persuasion: People are information processors, and they have limited resources from which to process information. Lang, who pioneered the theory, explains: "You can think about one thing, or two, or maybe seven, at the same time, but eventually all your resources are being used, and the system cannot think yet another thing without letting a previous thought go." (Lang, 2000, pg. 47)

Lang's theory focuses on how information is encoded, stored, and retrieved – not on how attitudes are formed from it. But researchers have looked at the interplay between processing and credibility perceptions, from the point of view of advertisers hoping to ensure their messages are both persuasive and remembered. Cameron (1994) found that cognitive processing of a message increases when a source has higher credibility. Rodgers, Cameron, and Brill (2005) found that placing a sponsorship message in the middle of an Internet news story increased sponsor recall – creating a new memory trace as it interrupted the cognitive processing of the news content. But it

came with a trade-off, as placement in the middle of a news story provided less credibility than at the beginning of a story.

The social-psychological theories of dual-processing informed a new wave of credibility research – and add-on theories – that focused specifically on the Internet’s increasingly expansive possibilities of message communication – a wave in which this thesis hopes to take part.

Internet revolution

As information moved online, the gates and silos of information movement began to evaporate, complicating credibility assessment. In the old days, messages could be measured based on standard-sized newspapers, billboards, common-length TV or radio ads. In essence, there were few players giving the messages, and there was basic structure to how messages were delivered. That’s one reason that media credibility studies of old typically measured credibility by the mediums studied, such as Roper studies that helped launch the newspapers-versus-TV credibility war of the twentieth century. But by the twenty-first century, one website could have all those elements of all those mediums – audio, video, text, art – and mixed in exponential ways to cook a unique casserole of media imprints. And that website could be run by anyone with off-the-shelf software – in essence knocking down the prior gates to message spreading. An Internet user could just as easily head to a website run by the New York Times or one started by a brooding teenage boy in his mother’s basement.

The lowered gates concerned some researchers, who began asking whether Internet users could discern between credible information and wild inaccuracies. Flanagin & Metzger (2000) noted that the “factual verification” once done by newspapers, books, magazines, and television “now fall upon the shoulders of the media consumer.” Their methodology borrowed from prior media credibility studies while their results followed dual-process theories. The pair studied the Internet as just one more type of media channel, on the same level as printed newspapers, printed magazines, and broadcasted TV and radio. They found only newspapers outranked the Internet for credibility, which they said was “somewhat alarming” considering how much misinformation could be online, and even more concerning because their study found most people do little to verify online information. But in digging deeper on Internet usage, the pair found that the level of verification, and perceived credibility, varied by the topic sought by and level of experience of the Internet user. More experienced users tend to validate information more, and – in a nod to the dual-processing models of attitude formation – that subjects that offer little risk to users if the information is bad, such as entertainment news, are viewed with less skepticism, as compared to subjects that offer higher risk to users if the information is bad, such as reference material (Flanagin & Metzger, 2000).

Metzger (2007) proposed simply adopting the dual-processing models of cognitive processing developed by social psychologists as applicable to credibility assessments on Web sites as well. Users who are less motivated to find highly credible information, such as someone surfing online to pass the time, is more likely to assess

credibility through heuristics than users who are highly motivated to ensure a Web site is accurate, such as someone just diagnosed with a life-threatening disease and seeking the best insight on cures.

But other researchers began suggesting off-shoot models of the dual-processing theories that were more tailored to the formation of credibility perceptions online.

Fogg (2003) argued that credibility had become the key benchmark for determining whether users stayed on or abandoned an Internet site. In arguing that web site designers had to take this into account, Fogg proposed the Prominence-Interpretation Theory, which has two overarching, arguably simple elements: a user has to notice something (prominence), and then a user has to judge what's noticed (interpretation).

Hilligoss (2008) proposed a unifying framework of credibility assessment, arguing there were three distinct levels of credibility judgments: construct, heuristics, and interaction. The levels drill down from broad to specific. Construct relates to how a specific person defines credibility, noting every person may define it differently, and even the same person may define it differently based on the type of information sought. The heuristic level involves "general rules of thumb" – used across situations – to make judgments of credibility. The interaction level is the most specific to a situation of credibility assessment, noting the involvement of content, peripheral source cues, and peripheral object cues.

About the same time, the MAIN model was developed by S. Shyam Sundar in 2008. His model focuses on heuristics, which Sundar defines as “evolved generalizations stored in one’s knowledge base that often get refined with experience.” (Sundar, 2008, pg. 75). Sundar’s model argues that the effects of heuristics could be categorized through four technical “affordances or capabilities” of the online world: Modality (M), Agency (A), Interactivity (I), and Navigability (N). Sundar argued that these four concepts could help explain any assessment differences in credibility beyond message differences.

Recent studies reviewing online credibility

Even within the expanded models for Internet messages, researchers have continued to adopt HSM itself to help us understand news credibility in the digital age. As Hyunjin, Keunmin, Shaoke & Sundar (2011) noted about HSM:

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, which include news credibility evaluation. (pg. 22)

The four researchers used HSM to study the effect of message credibility based on source credibility, but with a twist. Noting how many news stories can travel long journeys of links to get to an online reader’s attention, the study looked at whether readers judge message credibility based solely on cues triggered by finding only the

most proximate source – such as the aggregation website a story may be posted – or whether (and when) readers may expand their investigation to find the name of a message’s primary source to better assess message credibility. Their findings reinforced HSM’s sufficiency principle, in that readers who felt high involvement in an article tended to do the extra work to track down and assess the credibility of distal, primary sources versus those with low involvement, who typically used heuristics to assess the most proximate source.

Lee & Sundar (2013) also looked at cues involving proximate and distal sources, as well as other cues, as part of a look at the social media website Twitter, in which users can either broadcast short messages to followers or follow the short messages that others post. Beyond looking at source proximity, the researchers studied the “bandwagon” heuristic – “If others think this is good, then I should too” – as well as the “authority” heuristic – that “experts can be trusted.” The study’s goal was to measure the interplay of each in the context of controversial health messages, and it found that message credibility was higher for messages tweeted directly by a professional source with many followers, suggesting the bandwagon and authority heuristics at work. But the potentially more interesting findings resulted from studying retweets under the same scenario, in which users found less credibility. The researchers suggested that HSM’s attenuation effect may have kicked in, perhaps with a retweet triggering in the reader more systematic processing that attenuated bandwagon and authority heuristics. The research led to what could be considered unexpected advice for health

practitioners: If they're new to Twitter with few followers, retweet more information. But as they grow in followers, retweet less and tweet more original content.

Ringel, Counts, Roseway, Hoff & Schwarz (2012) looked at the believability of tweets through heuristics, but measured credibility while manipulating user names and user avatar images. For user names, the independent variables were a traditional name, such as "Alex Brown," a pseudonym style common for the internet, such as "tenacious 27," or name based on topical interest, such as "AllPolitics." Photos could be one of five categories: male photo, female photo, an icon related to the topic of the tweet, a generic icon, and the default "egg" icon inserted by Twitter if a poster has not uploaded any icon. The study found that – for user names – Tweets from users with topical names, such as "AllPolitics," were perceived as more credible, followed traditional names and internet pseudonyms. But the study found little difference in perceived credibility based on the heuristics of the avatar images – except in the case of the default "egg," which showed lower credibility. Interestingly, their study also mixed true and false tweets and found that users were poor judges of determining actual truth of tweets. HSM was not mentioned specifically within the research – researchers instead pointed to Fogg's Prominence-Interpretation Theory – but all the while they noted the level heuristics play in credibility assessment, a nod to HSM's explanations of how such assessments are reached.

Xu (2013) looked at the effect of news "cues" in perceived credibility of articles referenced on Digg.com, a social media website that lets users bookmark (or digg) an

article from mainstream news sites and other sources. She found that by manipulating the number of diggs – or other readers who supposedly bookmarked the story – she could trigger the “bandwagon” heuristic. Xu explained her findings through HSM’s sufficiency principle by noting that people are “cognitive misers” who spend as little effort as possible to assess credibility: “If one cue is sufficient to assist the decision, they would not even bother to process the other cues.” (Xu, 2013, pg. 770).

Westerwick (2013) studied message credibility – the silo of credibility assessment dedicated to the actual message being conveyed – and wanted to see how it was affected by altering website design and perceived source credibility. He found that a better-perceived website design was not enough to overcome effects of poorly perceived source credibility. In other words, he found, a poorly-perceived website cannot boost the credibility of its messages by simply jazzing up its web design. While he tied his research to Sundar’s MAIN Model and HSM’s cousin, ELM, the study also could reinforce HSM’s additivity hypothesis, in that cues offer conflicting heuristics can minimize attitude changes, versus cues that trigger congruent heuristics.

Johnson & Wiedenbeck (2009) studied the effects of adding biographical information and hyperlinks to stories of citizen journalists posted on Ohmynews.com and found that perceived credibility of the story is increased by adding either, and by more if both are used. The researchers tied their findings into Fogg’s Prominence-Interpretation Theory, citing Fogg’s concept of credibility-boosting “markers,” such as a site listing a writer’s credentials as well as source links. But the study reinforces HSM,

not only by finding that cues of source biography and hyperlinks can individually trigger heuristics that affect credibility assessments, but also by finding a combined, increased effect when both cues were present. This latter finding reinforces HSM's additivity hypothesis, which suggests when multiple cues that trigger consistent heuristics will have a combined, stronger influence on attitude formation than in isolation or in conflict with other cues. Also interesting for this thesis, Johnson and Widenbeck found that less than a third of the study participants actually clicked on the hyperlinks, and on average less than 1 of 17 possible hyperlinks was clicked. They asked study participants to rate the statement: "Just the fact that the story contained hyperlinks (even if you didn't click on them) made the story seem credible." The researchers found that those who agreed with the statement also offered higher credibility scores, helping underpin this thesis H1.

From the research of Johnson and Wiedenbeck (2009) flows a natural off-shoot question: How does the presence of links for source documents affect perceptions of credibility? Researchers through the years have studied the various add-ons that online news provides – from tweets to diggs – and the DocumentCloud functionality is one more add-on that could improve perceptions of credibility, or, in the alternative, be a big waste of time for reporters trying to impress consumers who don't really care. As newsrooms continue adopting DocumentCloud, researchers should be asking whether it's worth it.

The evolving research have shown that the best way to measure news credibility perceptions is by continuing the marriage of news credibility research into the broader persuasion research, and its models of dual-processing. HSM offers a more robust model that can help explain the interplay of heuristic and systematic processing through a low-motivational setting typical of news consumers.

News media literacy

As persuasion research can be traced to Aristotle, some scholars also trace the advent of media literacy to study of rhetoric in ancient Greece, and in particular the pushing of critical thinking skills (Hobbs & Jensen, 2009).

Media literacy was reborn in the twentieth century with the introduction of film. Educators looked to teach students about how to critically assess the new medium. Joined by those in media and cultural studies, the cross-disciplinary work focused on looking behind the curtains of how media was produced, but often from broad and varying viewpoints (Hobbs & Jensen, 2009). One arm has focused on the educational message, hoping to teach media users the latest media, in what has been termed digital literacy. Another arm has focused on fostering criticism of perceived power structures controlling the media, promoting users to make judgments not just on the media message but on the potential motivations of the media producer.

While scholars have approached media literacy from broad points of view, they've also focused on different types of media and message motivations, including media geared toward delivery of news. This branch of media literacy – called news

media literacy – refers to “the knowledge and motivations needed to identify, appreciate, and engage with quality journalism.” (Craft, Maksl, Ashley, 2013, pg. 2)

Some scholars have argued that this branch of media literacy carries particular importance because of the role news plays in democracy. News is expected to inform self-governing citizens to make wise decisions, with Ashley, Maksl & Craft (2013) pointing out the wide potential in the field:

When we connect existing scholarship about the limitations of news media with the goals of media literacy education, the implications for the potential importance of *news media* literacy are clear: Audiences could be better equipped to access, evaluate, analyze and create news media products if they had a more complete. (pg. 1)

Scholars have debated how to determine what makes someone “literate.” Craft, Maksl & Ashley (2013) in part tie media literacy into how news is processed. While not directly mentioning dual-processing models such as HSM, the scholars say one measure is the “degree to which one engages in mindful versus automatic thought-processing of news.” (pg. 7) This could correlate to HSM’s categories of heuristic and systematic processing, helping further ground the inclusion of news media literacy into this study.

While the volume of studies of news media literacy is far fewer than those for the dual-processing models, one study has looked at how a quick dose of education on the news media can affect credibility. Ashley, Poepsel & Willis (2010) split subjects into two groups that read a series of articles and rated them on a variety of factors, including

credibility. The difference was that – before reading the series – one group was exposed to a media literacy message. The message was an article on the pros and cons of the consolidation of media ownership, with the study positing that the group getting the media literacy message would find the series of following articles less credible than the other group, which was given poetry. The study measured judgments of truth, superficiality, general accuracy and completeness. The experiment found a statistically significant tie to general accuracy and superficiality, although not to other common credibility measures tied to truth and completeness. This study's fourth hypothesis attempted a similar review, albeit avoiding a negative literacy message offered in the 2010 study (on the ills of corporate media ownership) with a positive literacy message (on the importance of journalists seeking source documents).

The author of this thesis could not locate any studies attempting to correlate news media literacy with the age of subjects, but Craft, Maksl & Ashley (2013), in their study devoted to measuring teen news literacy, noted that “theory tells us that greater news media literacy goes hand in hand with ... behaviors such as paying attention to current events, voting and other forms of civic engagement.” (pg. 1) In other disciplines, scholars have found that such patterns, including knowledge of current events, increase with age (Beier & Ackerman, 2001), offering a methodological branch from which to test age and media literacy within the framework of news processing.

Research Design

This study tested the impact of DocumentCloud links to online news articles on levels of credibility reported by online news consumers, positing the following, based on the principles of HSM and media literacy:

H1: Online articles with a side box that advertises links to source documents will be more credible than online articles that do not have such side boxes.

H2: Online articles in which consumers click on hyperlinks of source documents will be more credible than online articles in which users do not click on hyperlinks of source documents.

H3: Consumers who feel more personal involvement in a story will be more likely to click on hyperlinks than those with less personal involvement.

H4: Online articles with a side box that educates consumers on the importance of verifying stories through source documents are more likely to have their hyperlinks clicked than online articles with side boxes that do not contain such an educational message.

H5: Among subjects given the option to click on hyperlinks, consumers younger than 35 will be less likely to click on hyperlinks from boxes without an educational message than consumers 35 and older.

The hypotheses was tested in a 3 (article type) X 2 (article message) between-subjects study.

Recruiting subjects

This study recruited 299 paid subjects from Amazon's Mechanical Turk, also known as MTurk, to complete a survey using Qualtrics software, in which the subjects answered questions on perceived credibility about two condensed articles they read, one or both of which may have – based on random selection – been accompanied by a sidebox denoting that source documents are available and, in some instances, contained an education message extolling the virtues of verifying source documents.

This study used MTurk, which increasingly has been utilized by researchers to recruit subjects for studies (Buhrmester, Kwang, & Gosling, 2011). MTurk is a service provided by Amazon that acts as an online marketplace for task seekers to meet and employ task performers. Task seekers deposit money in an account that pays task performers for performing typically simple tasks, such as typing, for a few minutes for a very small fee, typically less than \$1. Task performers will look through postings by task seekers describing the job, and, if the task performer agrees, the performer will then complete the task and get paid. The payment can be made automatically or after a task seeker has verified the work. Because of its structure, researchers have been drawn to MTurk to find a large number of subjects for low-cost surveys, and researchers have found that sample demographics are at least as diverse as traditional surveys and as reliable (Paolacci & Chandler, 2014). That was particularly important for this research.

Traditionally, it would be done on a college campus using students, but that sample likely would not have provided the type of age diversity needed to complete this research.

There are potential negatives to using MTurk that this research tried to mitigate. Left unmitigated, there is no guarantee that a sizeable pool of respondents will be drawn to take the survey in a relatively short window of time, leading to the risk that significant news events could affect some later respondents. Nor is there a guarantee that paid respondents won't zip through a survey, giving little thought to answers, in order to quickly collect the cash – and then perhaps do the survey a second, third, or fourth time. And, with MTurk users across the globe, there is no guarantee the respondent will be an American news consumer, the target of the research. Despite those limitations, however, researchers consider MTurk on the forefront of becoming a major research tool, based on steps that can be taken to minimize potential negatives (Buhrmester, Kwang & Gosling, 2011).

This study paid respondents \$1, which is far higher the rate that researchers have demonstrated can quickly draw a large sample size (Buhrmester, Kwang, & Gosling, 2011). As common in research utilizing MTurk, this study also included instructions requiring respondents pay close attention in order to be paid, combined with special “catch trial” questions to ensure that respondents gave some thought to answers given. Respondents were timed on how quickly they completed aspects of the survey, and those finishing too quickly to indicate careful consideration of the questions – based on

pre-survey timing tests done by the researcher – were not be paid. Respondents were chosen among those users who have identified their country of origin as the United States, and those who had high approval rates, which is also shown to improve data quality (Peer & Acquisti, 2013). Respondents also were given a randomly generated, unique ID to be turned in for payment, with IP addresses monitored to ensure respondents didn't repeat the study.

Survey material and methodology

The survey was conducted using Qualtrics software, which researchers have used in combination with MTurk to produce more detailed surveys that can't be replicated in Amazon's online shell. Respondents who agree to participate through MTurk clicked on a link that took them to the unique Qualtrics website for this survey.

The survey informed respondents that, to get paid, they had to carefully answer the questions in the survey and, once completed, copy a unique code that was typed into Amazon's website for payment. Qualtrics was programmed to randomly assign an equal number of respondents to one of three categories:

Category 1: The control group. This group was shown both articles without any sideboxes on either side.

Category 2: The standard hyperlink group. This group was shown both articles, with side boxes that advertise the ability to click on source documents through hyperlinks.

Category 3: The media literacy group. This group was shown both articles, with side boxes that contain the hyperlinks and an educational message on the importance of checking source documents.

The independent variables were stories that were versions of recent winners of the Pulitzer Prize for investigative reporting, in an attempt to find real-world examples of articles that have used DocumentCloud and been vetted for quality and a type of reporting that typically relies more on heavy analysis of source documents to reach findings. The stories were condensed for this study – a common technique to avoid subject fatigue (Sternadori & Thorson, 2009). While the facts in the story were consistent with what was reported in the original versions of the stories, simulated names of publications and authors were used to avoid any potential confounding variables. For groups seeing boxes within the stories, each box for each story was roughly the same size and appeared in the same area of the online presentation. Each story had three hyperlinks linking to actual source documents for the story posted in DocumentCloud. Descriptions of the linked documents were nearly identical, except for editing to ensure the boxes were the same size. (Please see Appendix 1 to see the two articles, wording of boxes for each of three options within each version, and links to documents cited.)

Before the first story was shown in each group, respondents were asked a series of demographic questions on their age, education, gender, race, income and their news consumption habits. After completing those questions, respondents were shown the

first story of their assigned group, randomly picked by Qualtrics. Those groups shown hyperlinks were allowed to click on them, in which the link opened in a separate browser window to source documents maintained in DocumentCloud. To measure the dependent variables, respondents were then be asked a series of questions to gauge whether they had previously read about the subject of the article, their personal connection with the article, and how credible they thought the article. Amid those questions, subjects also were asked a manipulation-check question to answer a multiple-choice question on the nature of the article, with only one option being accurate and three others being so wildly incorrect as to offer little possibility that a subject who read the article would answer incorrectly. Any respondent answering the manipulation-check question incorrectly was immediately shown a screen reminding them that the survey rules required they pay close attention and notifying them that their participation in the survey had been terminated.

Upon completing those questions (and accurately answering the manipulation-check), respondents were shown the second article, and asked the same questions about the second article, along with another manipulation check question. Upon completion of the survey, respondents were given a code to enter in MTurk to receive payment. That code, along with the unique MTurk ID and IP address, was used to individually track the anonymous respondents and match them with prior answers given, along with any clicking of any hyperlinks to access source documents. The researcher approved payment for subjects who successfully completed the survey. (Please see Appendix 2 that lists survey questions.)

The results of the surveys were analyzed for internal consistency and significance. While past research has shown the reliability of operationalized questions of credibility and personal involvement (Westerwick, 2013), this study re-affirmed that reliability of the operationalized questions by testing the coefficient alpha of the five- and four-item scales. Each hypothesis was then tested for a null finding with a single-factor ANOVA, calculating F with a confidence level of .05. Also, some group were compared to each other with T-tests, again calculating F with a confidence of .05.

Results

The survey was conducted on a Saturday morning and afternoon in September 2015. The surveyor attempted to recruit, through the limits of Mechanical Turk and Qualtrics software, an equal number of participants below age 35 and above age 35 for each group. Care was also taken, in the study design, to eliminate participants at risk of racing through the survey just to get the money. Those two issues combined to create a largely, but not perfectly, balanced survey.

The first batch of respondents was recruited around 10:30 a.m. Central Time. Of 402 total potential recruits at that time, 69 recruited toward the end of that batch were immediately disqualified because their age group was over-represented. Upon review of the data, an additional 74 recruits were eliminated because they failed either an attention-check question or failed a time-check. That left only 259 valid responses received, requiring a second batch of survey recruitment messages be run through Mechanical Turk around 2:30 p.m. that same day.

In that second run, there were 43 total potential recruits, but two had to be immediately eliminated because their age-group quota had already been filled. Upon review of the data, 5 additional recruits failed either an attention check or time check, leaving 36 valid responses from that group, leaving the total number of valid responses at 295. A small, third batch was tested around 3:30 p.m. that day. Of that batch, 13 potential recruits responded, but 8 were immediately disqualified for their age groups

being over-represented. Of the rest, none failed attention checks, bringing the total valid responses to 300 – the original goal of this study.

Unfortunately, upon further review of all 300 responses, one was found to have not completely filled in all answers. The surveyor believed he had programmed Qualtrics to force responses to all answers for a survey to be completed, but in this case one invalid response slipped through. That invalid response was eliminated from the results, leaving 299 valid responses. Also, upon further review, it was discovered the respondents had not been exactly equally distributed among all groups and age sub-groups, despite the surveyor believing that equal randomization had been programmed into the survey design. That left a largely, but not completely, evenly distributed level of respondents among the subgroups:

Group	Age Category	Participants
1	Under 35	51
1	35 and over	48
2	Under 35	52
2	35 and over	52
3	Under 35	47
3	35 and over	49

The scales were tested for internal consistency and all variables were found to load properly. (Please see Appendix 2 for all results.) Each respondent was asked five questions that relate to credibility, for each story shown. A Principal Component Analysis shows that all 10 questions load acceptably into one component, with a satisfactory Cronbach's Alpha of 0.871, which does not increase with the removal of any

questions. Each respondent was also asked four questions that relate to personal involvement, for each story. A Principal Component Analysis of those eight questions shows they load successfully into one component, with a satisfactory Cronbach's Alpha of 0.798. This alpha would increase with the removal of one of the eight questions, but only slightly to 0.809 – a movement too inconsequential to warrant removal of the question from the grouping.

The hypotheses could then be tested.

H1: Online articles with a side box that advertises links to source documents will be more credible than online articles that do not have such side boxes.

Because the survey included three groups, a One-Way Anova analysis was first performed. It showed a slight increase in the mean score for credibility, particularly for Group 3. But this increase was not statistically significant enough to support the rejection of the null hypothesis, with a significance rating between-groups of 0.163 – far higher than acceptable for this study to declare the null hypothesis unsupported. The potential of significance rises when performing a one-tail T-Test comparing just Group 1 and Group 3. It offers a P score of 0.048, suggesting that, at least with a sidebox combined with an educational message, there is support for the null hypothesis being rejected if H1 had been refined to theorize an increase in credibility in that specific scenario.

H2: Online articles in which consumers click on hyperlinks of source documents will be more credible than online articles in which users do not click on hyperlinks of source documents.

Only 40 respondents clicked on a hyperlink, offering a small sample size to analyze. When performing a T-test comparing just those in Groups 2 and 3 who clicked on a link, versus those in Group 2 and 3 who did not, it shows only a slight increase in mean from non-clickers (5.077) to clickers (5.09), with a P value of .46 (NS). Even when opening up a T-test comparison to all groups, regardless of whether they saw a sidebox or not, the mean rose just from 5.037 for non-clickers to 5.09 for clickers, with a one-tail P factor of 0.36, far out of the range of statistical significance. Therefore, the null hypothesis cannot be rejected.

H3: Consumers who feel more personal involvement in a story will be more likely to click on hyperlinks than those with less personal involvement.

The mean score of personal involvement actually dropped for those who clicked on links than for those who did not. Of the 40 who clicked on links from Group 2 and 3, their mean score for personal involvement was 4.71. The mean score for those who did not click on a hyperlink was 4.78. The results support the null hypothesis.

H4: Online articles with a side box that educates consumers on the importance of verifying stories through source documents are more likely to have their hyperlinks clicked than online articles with side boxes that do not contain such an educational message.

Among the Group 2 and Group 3 respondents offered the chance to click on hyperlinks, a slightly higher rate of those in Group 3 (shown the educational message) did click on a hyperlink: from 18.3% to 21.9%. But because of the small sample size, even a one-tailed P value from a T-test did not come close to approaching statistical significance, with a P score from Fisher's Exact Test of .323. The null hypothesis cannot be rejected.

H5: Among subjects given the option to click on hyperlinks, consumers younger than 35 will be less likely to click on hyperlinks from boxes without an educational message than consumers 35 and older.

The results actually showed that, of Group 2 respondents (which was the group not shown an educational message), a greater percentage of younger respondents (under 35) clicked on links than older respondents. And, in just looking at younger respondents between groups 2 and 3, a slightly greater percentage of respondents younger than 35 clicked on hyperlinks when *not* shown an educational message than when did, from 21.2% to 17%. Interestingly, the greater potential effect of an educational message surfaced with older respondents. Only 15.4% of the Group 2 older respondents clicked on a link, versus 26.5% of older respondents in the educational-message Group 3. Even then, likely because of the small sample of clickers, the Fisher's Exact Test for a one-tailed T test scores a P factor of 0.128, still beyond the realm of statistical significance. Therefore, the results support the null hypothesis.

Beyond the stated hypotheses, the researcher delved into any potential effects of sub-groups in an attempt to better tease out any nuances in the data. Sub-groups were chosen based on demographic questions posed and other measures taken, with groups split in ways that they would appear to offer a relatively even spread of respondents, offering a greater chance of culling meaningful findings from their answers.

In looking at differences between men and women, one potentially interesting finding surfaced when looking at credibility and educational messages within side boxes. Women in Group 1 reported an average credibility of 4.99, while women in Group 3 reported 5.38. A Tukey HSD test offered a P-score of 0.055, which is marginally significant.

A statistically significant finding occurred when looking at education levels. In considering the sub-group of respondents who lacked a bachelor's degree or higher, the mean credibility score for each group rose from 4.91 (Group 1) to 5.16 (Group 2) to 5.44 (Group 3.) A One-Way Anova found a P score of 0.026, with a Tukey HSD Test showing significance of 0.019 between Group 1 and Group 3, suggesting that a refined H1, narrowed to comparing just Group 1 and Group 3 among less-educated consumers, would have enough evidence to support rejecting the null hypothesis.

Statistical significance, however, did not carry over to the results for looking at income. The closest to such significance came when looking at respondents who reported income of \$40,000 a year or less. That mean credibility score for each group

rose from 4.94 (Group 1) to 5.10 (Group 2) to 5.29 (Group 3.), but a One-Way Anova found a P score of 0.252, far beyond the threshold for significance, with confirmation by a Tukey HSD test of no significance by comparing groups to each other.

Nor did statistical significance carry over when looking at the online news habits of consumers. At best, when looking at habits of those who reported less than frequent use of either online national or local newspaper sites, the mean score for credibility was nearly identical for Group 1 and 2 (4.931 and 4.934) but rose to 5.13 for Group 3. A One-Way Anova reported a P score of 0.50, with no significance confirmed between either Group 1 or 2 and Group 3 in a Tukey HSD test.

There was no statistical significance when looking at how much time was spent, on average, reading stories. The most likely to have significance, based on means, was focusing on respondents who spent an average of 30 seconds or less reading each article – basically those skimming. For that subgroup, the mean credibility score hovered for Group 1 and 2 (5.01 and 4.97) but rose for Group 3 to 5.34. A One-Way Anova reported a P score of 0.33, with a Tukey HSD test confirming no significance between Group 1 and 3.

There was also no statistical significance comparing the reaction of one story versus another. The mean credibility score for the coal story rose from 5.00 (Group 1) to 5.07 (Group 2) to 5.26 (Group 3), with a One-Way Anova P-score of 0.143. A Tukey HSD test confirmed no statistical significance between any of the groups. Meanwhile, the mean credibility for the drug story for Group 1 was 4.94 for Group 1, dropped to 4.89

for Group 2 and rose to 5.11 for Group 3. A One-Way Anova P-score of 0.310 did not suggest statistical significance, confirmed by a Tukey HSD test showing statistical insignificance among comparisons of each group.

Discussion

This research theorized that there were to be broad effects, both with heuristic and systematic processing, seen in the use of DocumentCloud. That was not the case. But there were interesting, and potentially helpful, findings that suggest DocumentCloud could improve credibility for certain subsets of readers, as well as suggest it's not as much whether source documents are shown, but what type of message introduces readers to those links being available.

First, it should be noted that one way to read the results is that it is good news for the news media. Regardless of whether source documents were shown, readers generally considered the articles credible, which is no small accomplishment for an industry constantly under assault amid accusations they're hacks with little regard for facts and integrity. But with this study's articles being judged, on their face, as more credible than not, it left little room for DocumentCloud to enhance that perception. The mean credibility scores almost always rose from Group 1 to Group 3, with Group 3 scores never lower than Group 1 or 2 scores. But the rise, in a broad sense, was not statistically significant as theorized. It suggests that the use of DocumentCloud, at the very least, is not hurting credibility of news articles. It's just a question of how much it's helping.

For DocumentCloud, there are promising results when looking specifically at the use of an educational message. The results of this study build upon the results of Ashley, Poepsel & Willis (2010) to find that educational messages cannot only affect credibility perceptions when the messages are negative, but when the messages are positive as well. While the growth in credibility was arguably weak, at least in comparing the control group (Group 1) to the subjects given the educational message (Group 3), the growth was statistically significant. Delving deeper into this relationship between Group 1 and Group 3 provides more significance for specific sub-groups, with the most significance found for those readers who may have less of a formal education. Perhaps it is not surprising that an educational message can best help those with less formal education. But it is noteworthy that simply offering an educational message – regardless of anyone clicking on a link – seems to have, if ever so slightly, boosted the perception of credibility among certain subsets of respondents who saw it. Perhaps it suggested to some readers that those who produced the article had a bigger interest in education than setting an agenda. More research would need to be done to tease that out. Regardless, taken in whole, the results suggest that DocumentCloud side boxes with educational messages will have the most effect on triggering credibility heuristics in those who may not have already built up other heuristics through deeper educational experience. And in a media world where journalists are fighting for every eyeball, an approach that doesn't appear to hurt credibility, and can enhance it among some but not others, is arguably a bargain worth taking.

What does not appear to have much effect in online news consumption is any systematic processing, at least in the decision to click on hyperlinks and later judge the credibility of content. The study theorized that a higher perception of personal involvement would trigger systematic processing to prompt clicks onto links. That didn't happen. The study theorized that, once those clicks occurred, consumers would have a higher credibility rating of the stories they read. That didn't happen. Also of note, the study theorized that younger consumers getting an educational message would be induced to click on hyperlinks, and, if anything, the opposite happened. To news organizations, this could signal even more the need to ensure not only a quality product, but a presentation that ensures heuristics taken into account.

Limitations

Even though prior research has shown that the recruitment of Mechanical Turk users did not have overly negative effects on study results, this study caught a disturbingly high number of respondents failing basic attention checks. This leads to concern that other respondents – willing to whip through a survey just for the cash – may have slipped through. That raises an issue of external validity, because online consumers aren't racing through news to collect a tiny paycheck. They're typically looking to learn or pass time.

Another concern with external validity centers on the types of stories used. This research used condensed versions of Pulitzer Prize-winning investigative stories. On the one hand, it could be argued investigative stories such as the ones displayed have the

most play in credibility assessments, because so much depends on whether consumers believe what they're seeing. That, in fact, is why this research chose those stories. But at the same time, almost every news article, and the vast majority of investigative stories, do not cover the type of subjects and contain the type of dramatic findings as Pulitzer Prize winning stories, so this study's results may not have external validity to more common everyday news articles.

A final limitation is the low number of hyperlink clickers in this study. While perhaps not unexpected – past research has also shown the vast majority of news users do not click on hyperlinks of related content – it does make it difficult to draw any inferences on what clickers were thinking, and why they did what they did.

Suggestions for further research

Because of those limitations, future researchers have many options for furthering the look at credibility perceptions from displays of source documents, particularly those with educational messages.

Further research could focus on the types of educational messages that can be offered, to determine both any heuristic cues triggered or strengthened, as well as any systematic processing that could be induced. That research could better tease out any effect of an educational message, and potentially detect a specific type of educational message that offers maximum benefit for news producers and maximum comfort in credibility for news consumers – perhaps dependent on word choice, length, graphics, art, or page placement, to name just a handful of potential variables.

Along those lines, research could also focus on what specific sub-groups of consumers may see greater rises of perceptions of credibility from educational messages mixed with source document hyperlinks. This study suggests, albeit weakly, that online consumers with less educational experience may be the mostly likely to see perception changes. Is that true? Are there other groups?

Research could also focus on the type of articles that may see the biggest effect from an educational message. This study tests condensed versions of Pulitzer Prize-winning stories. What about more common stories, such as crime stories or city council coverage?

If links to educational messages and increased credibility are found in further research, researchers could also pivot to consider qualitative work that can explore why an educational message may make some consumers believe certain content is more credible. Do educational messages give consumers more confidence in the people producing the content, as this discussion suggests? Do such messages induce a more thoughtful review of content – even if no clicks are made – suggesting a triggering of systematic processing? Respondents in future surveys could simply be asked what they thought of such an educational message combined with hyperlinks to source documents.

And researchers may find a more realistic test of effects by conducting a similar survey on traditional, in-house subjects, to model after more real-world media consumption. Perhaps these will be subjects told they will be in one place for a half-

hour, regardless of when they finish the survey. So they will have less incentive – and ability – to rush through in any zeal to quickly collect cash for taking a survey and moving onto a new online job. Beyond offering a potentially more realistic way to gauge heuristics, such an environment, free of fast skimmers, could offer a better chance for systematic processing to be gauged.

Conclusion

The traditional news media are in a tough spot in the 21st Century. A changing business model has increased the number of potential competitors, dramatically cut more lucrative revenue streams, and changed the way the product is made. At the same time, the changing business model offers traditional news media the opportunity to offer far more content than before. And one such creation is DocumentCloud, which allows reporters to relatively easy upload source documents, annotate them, and display side boxes alongside articles that let consumers click to see documents that helped shape the conclusions reached in articles. The hope is that such content can be one element of helping boost credibility numbers that have been sagging for generations.

One way to study credibility perceptions is through the dual-processing Heuristic-Systematic Model, developed by Chaiken and Eagly (Sundar, 2008), in which systemic processing occurs for subjects deemed relevant while heuristic cues are used as short-cuts to make quick, efficient judgments on less-relevant material (Sundar, 2008). This model has been applied to research in the online world, including processing of news articles, but not to DocumentCloud, until this study. Another way to look at DocumentCloud is through news media literacy, a body of research that focuses on effects of educational messages on consumer behavior and beliefs. This study aimed to gauge both heuristic and systematic effects, with and without an educational component tied to what was being processed.

The results were mixed. For sure, the study does not suggest DocumentCloud is the panacea to woes over credibility perceptions. But the study cannot rule out broad effects either, and, at least for side boxes with educational messages, and in particular for less-educated consumers, the results suggest that credibility perceptions are boosted with the use of DocumentCloud. It leaves wide room for further research to find more realistic scenarios in which test whether any effects exist, to what extent, with whom, and with what educational message.

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ARTICLES BY GROUP

Subject Group Category 1 - Story 1

*By Jake Jones
Herald and Times*

Sick coal miners regularly denied benefits

The coal industry for years has withheld evidence and used questionable legal tactics to routinely deny sick and dying coal miners modest benefits and affordable medical care.

At the heart of the cutthroat tactics is the go-to law firm for the coal industry, Jackson Kelly. In one case, the firm's own experts diagnosed a man with a disease that qualified him for benefits, yet the firm forced the man to keep fighting to try to get benefits for a decade, until the man died.

An investigation by the Center for Public Integrity found that the law firm, over the years, has withheld unfavorable evidence and shaped the opinions of its reviewing doctors by providing only what it wanted them to see. Miners, often lacking equally savvy lawyers or even any representation, had virtually no way of knowing this evidence existed, let alone the wherewithal to obtain it.

In the rare cases in which miners' lawyers have pushed for access to these materials and a judge has ordered disclosure, Jackson Kelly has fought back aggressively, arguing that it has the right to withhold them. Judges have called the firm's defenses of its actions "ludicrous" and "flimsy at best."

"This is pretty shocking," a current judge wrote of Jackson Kelly's behavior in a 2009 email obtained by the Center. "It appears to represent a long-standing pattern of misconduct."

In one case, career miner Gary Fox was diagnosed in 1999 with the most severe form of the disease, known as complicated coal workers' pneumoconiosis, by a doctor certified by the U.S. Department of Labor.

Jackson Kelly fought the case even though the firm had its own experts test a suspicious mass from Fox's lung, and those experts found it was likely black lung disease. Jackson Kelly then withheld the reports for years as a sick Fox was forced to go back to work in the mines to make ends meet. He eventually retired, too sick to work, and died in 2009, amid the legal battle over his benefits.

Subject Group Category 2 - Story 1

*By Jake Jones
Herald and Times*

Sick coal miners regularly denied benefits

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At the heart of the cutthroat tactics is the go-to law firm for the coal industry, Jackson Kelly. In one case, the firm's own experts diagnosed a man with a disease that qualified him for benefits, yet the firm forced the man to keep fighting to try to get benefits for a decade, until the man died.

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Source documents:

Documents referenced in this article are available on the links below:

- 1) [Law firm's own doctor said miner likely had black lung](#)
- 2) [Judge calls law firm's conduct 'pretty shocking'](#)
- 2) [Court disciplines lawyer for withholding key evidence](#)

Subject Group Category 3 - Story 1

*By Jake Jones
Herald and Times*

Sick coal miners regularly denied benefits

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You be the judge:

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- 1) [Law firm's own doctor said miner likely had black lung](#)
- 2) [Judge calls conduct 'pretty shocking'](#)
- 2) [Court disciplines lawyer for withholding key evidence](#)

the mines to make ends meet. He eventually retired, too sick to work, and died in 2009, amid the legal battle over his benefits.

Subject Group Category 1 - Story 2

*By Elizabeth Stewart
Review and Statesman*

State moves vulnerable patients to cheaper, more dangerous drug

A little known governmental body in Washington State moved vulnerable patients from safer pain-control medication to a cheaper but more dangerous drug – ignoring doctors’ warnings while deaths mounted.

Since 2003, at least 2,173 people in Washington have died from unintended overdoses linked to the drug. The poor have paid the highest price. Medicaid recipients represent about 8 percent of the adult population and 48 percent of methadone deaths.

For the past eight years Washington has steered people with state-subsidized health care — Medicaid patients, injured workers and state employees — to methadone, a narcotic known for being cheap and unpredictable. The state highlights the former and downplays the latter, cutting its costs while refusing to own up to the consequences, according to an investigation that includes computerized analysis of death certificates, hospitalization records and poverty data.

Methadone belongs to a class of narcotic painkillers, called opioids, that includes OxyContin, fentanyl and morphine. Within that group, methadone accounts for less than 10 percent of the drugs prescribed — but more than half of the deaths.

Jeff Rochon, head of the Washington State Pharmacy Association, says pharmacists have long recognized that methadone is different from other painkillers. “The data shows that methadone is a more risky medication,” he says. “I think we should be using extreme caution to protect our patients.”

One of those who died was a former 911 dispatcher, Angeline Burrell.

She endured a botched gall-bladder surgery that left her with chronic pain so severe she became depressed, lost her job, moved in with her mom and had to get Medicaid. Her doctor prescribed her methadone, despite Burrell also taking other medications that guidelines note can make methadone more dangerous to take.

Two days later, Burrell was found in a nightshirt, slumped on her bed, arms dangling with open hands. She had stopped breathing, her respiratory muscles paralyzed with stunning speed.

Subject Group Category 2 - Story 2

*By Elizabeth Stewart
Review and Statesman*

State moves vulnerable patients to cheaper, more dangerous drug

A little known governmental body in Washington State moved vulnerable patients from safer pain-control medication to a cheaper but more dangerous drug – ignoring doctors’ warnings while deaths mounted.

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One of those who died was a former 911 dispatcher, Angeline Burrell.

Source documents:

Documents referenced in this article are available on the links below:

- 1) [New York warns of problems](#)
- 2) [CDC notes high death rate](#)
- 3) [Woman’s medical records note danger before her death](#)

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Subject Group Category 3 - Story 2

*By Elizabeth Stewart
Review and Statesman*

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You be the judge:

Become better-informed on the reporters’ conclusions by reviewing the source documents they used:

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- 2) [CDC notes high death rate](#)
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SURVEY

Please note that questions with one asterisk (*) beside them indicated that the answers were provided in random order. The asterisk itself was not included in the survey and is only included here to help explain how the survey was conducted. Additional information on how the survey was conducted is below, noted in parenthesis and a sentence that begins "SURVEY NOTE." Just like the asterisks, these survey notes are only for the benefit of explaining how the survey was conducted and were not listed in the actual survey. In an attempt to ensure enough subjects were recruited to sample both older and younger consumers, a pre-test was conducted to screen candidates.

Pre-Test:

Thank you for taking this pre-qualification test for a survey. Please answer these two questions. If you qualify, you'll be forwarded to the full survey and qualify for payment. If you do not qualify, you will be told immediately and you will not be compensated. You can take this test only once. Thank you.

1) What is your gender? (Please select one of the following)

- Male
- Female

2) How old are you? (Please select one of the following)

- Under 35
- 35 and over

Actual survey:

You qualify to take this survey. First please read the following request for consent. After reading, if you consent to take part in this survey, click on the arrows below.

Researcher's Name(s): Joe Mahr

Project Number: 2002386 C

Project Title: Attitudes for Online Journalism

You are being asked to participate in a research study. This research is being conducted determine attitudes for certain aspects of online journalism. You will be asked to answer questions about yourself, read news articles online, and answer questions about those articles. This survey takes about 15 minutes.

You will be paid \$1 for your participation. Please understand you will not be compensated unless you complete the research and follow the research rules as well as Amazon's Terms of Service.

Your participation is voluntary. If you do not want to continue to be in the study, you may stop at any time without penalty or loss of benefits to which you are otherwise entitled but you will not receive compensation.

Your Amazon account information will be kept in the investigator's file and identified by a code only while we collect data for tracking purposes only. A limited number of research team members will have access to the data during data collection. This information will be stripped from the final dataset.

WHO DO I CONTACT IF I HAVE QUESTIONS, CONCERNS, OR COMPLAINTS?

Please contact investigator at jam737@missouri.edu if you have questions about the research. Additionally, you may ask questions, voice concerns or complaints to the research team.

If you have any questions regarding your rights as a participant in this research and/or concerns about the study, or if you feel under any pressure to enroll or to continue to participate in this study, you may contact the University of Missouri Campus Institutional Review Board (which is a group of people who review the research studies to protect participants' rights) at (573) 882-9585 or umcresearchcirb@missouri.edu.

You will first be asked basic questions about your life, and then must read two short news articles. After each article, you'll be asked your thoughts on that article. Please understand that, to get paid, you must carefully answer the questions. The entire survey is expected to take 20 minutes. Once finished, you will be provided a unique code that you must type into Amazon's website. Upon confirmation that survey rules were followed, payment will be approved. All participants remain anonymous. You may attempt the survey only once. Thank you for your time and help.

Tell us about yourself

1) How old are you? (Please type your two-digit age into the box)

(Answer will be typed into a box)

2) What is your gender? (Please select one of the following)*

- Male
- Female

3) What do you consider your primary race/ ethnicity? (Please select one of the following)*

- Caucasian
- African-American

- Hispanic
- Asian
- Other

4) What is the highest level of education you've completed?

- High school or less
- Some college
- Associate degree
- Bachelor's degree
- Graduate degree

5) What is your annual household income? (Please select one of the following)

- Under \$10,001
- \$10,001 to \$20,000
- \$20,001 to \$40,000
- \$40,001 to \$60,000
- \$60,001 to \$80,000
- \$80,001 to \$100,000
- Over \$100,000

6) Please rate, on a seven-point scale, the following statements of how often you get your news from the following (1 being never, 7 being every day): (SURVEY

NOTE: The next eight possibilities will be in random order. They are taken from

Holten, Coddigton, and Gil de Zúñiga (2013) as accepted measure to gauge media consumption.)

-Local TV news

-National TV network news (such as ABC, CBS, NBC, and PBS)

-Cable TV news networks (such as CNN, Fox News, and MSNBC)

-Radio news programs (such as NPR)

-Online sites of national newspapers (such as the New York Times or USA Today)

-Print versions of national newspapers (such as the New York Times or USA Today)

-Online sites of local newspapers

-Print versions of local newspapers

Please read the following article and, upon completion, answer questions about it. (SURVEY NOTE: One of two articles will be provided, through random order.)

Please answer the following questions about the article you just read

(SURVEY NOTE: If the article on coal was displayed, the following attention-check question will be first)

The article involved one of the following:*

- Coal miners
- Furniture
- Disney
- Circus acts

(SURVEY NOTE: If the article on methadone was displayed, the following attention-check question will be first)

The article involved one of the following:*

- Prescription drug deaths
- Antarctica
- Dream interpretations
- Prince William

Today was the first day I had heard of the specific information in the article.*

(SURVEY NOTE: I couldn't find a question in prior research to best test for prior knowledge of an article so I phrased it like this.)

- Yes
- No

Please rate, on a seven-point scale, the following statements: (SURVEY NOTE:
The next five questions will be in random order.)

(SURVEY NOTE: These next five questions taken from Westerwick (2013) as
accepted measure to gauge message credibility.)

1) This article is believable

2) This article is not accurate

3) This article is trustworthy

4) This article is biased

5) This article is complete

(SURVEY NOTE: These next four questions taken from Westerwick (2013) to
gauge topic involvement as proxy for HSM's sufficiency principle.)

6) This article is very relevant for my own life.

7) The article was very interesting.

8) I enjoyed the article very much

9) The article is very important.

FIGURES

Figure 1:

Credibility Factor Analysis

Communalities		
	Initial	Extraction
Q15_1 Please rate the following statements:- This article is bell	1.000	.600
Q15_2 Please rate the following statements:- This article IS accu	1.000	.670
Q15_3 Please rate the following statements:- This article is trus	1.000	.741
Q15_4 Please rate the following statements:- This article is UNbi	1.000	.796
Q15_5 Please rate the following statements:- This article is comp	1.000	.703
Q19_1 Please rate the following statements:- This article is bell	1.000	.702
Q19_2 Please rate the following statements:- This article IS accu	1.000	.686
Q19_3 Please rate the following statements:- This article is trus	1.000	.815
Q19_4 Please rate the following statements:- This article is NOT	1.000	.809
Q19_5 Please rate the following statements:- This article is comp	1.000	.646

Extraction Method: Principal Component Analysis.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
	1	4.726	47.261	47.261	4.726	47.261
2	1.349	13.488	60.749	1.349	13.488	60.749
3	1.092	10.924	71.672	1.092	10.924	71.672
4	.706	7.064	78.737			
5	.584	5.835	84.572			
6	.429	4.290	88.862			
7	.372	3.725	92.587			
8	.301	3.008	95.595			
9	.257	2.568	98.164			
10	.184	1.836	100.000			

Extraction Method: Principal Component Analysis.

	Component		
	1	2	3
Q15_1 Please rate the following statements:- This article is bell	.618	.342	.317
Q15_2 Please rate the following statements:- This article IS accu	.655	.479	-.107
Q15_3 Please rate the following statements:- This article is trus	.717	.376	.293
Q15_4 Please rate the following statements:- This article is UNbi	.595	.450	-.489
Q15_5 Please rate the following statements:- This article is comp	.656	.145	.501
Q19_1 Please rate the following statements:- This article is bell	.678	-.492	-.005
Q19_2 Please rate the following statements:- This article IS accu	.767	-.228	-.212
Q19_3 Please rate the following statements:- This article is trus	.803	-.408	.065
Q19_4 Please rate the following statements:- This article is NOT	.700	-.070	-.561
Q19_5 Please rate the following statements:- This article is comp	.658	-.414	.201

Extraction Method: Principal Component Analysis.

a. 3 components extracted.

Figure 2:

Credibility Reliability / Cronbach

Reliability Statistics

Cronbach's Alpha	N of Items
.871	10

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q15_1 Please rate the following statements:- This article is beli	44.63	70.610	.521	.864
Q15_2 Please rate the following statements:- This article IS accu	45.41	66.484	.574	.860
Q15_3 Please rate the following statements:- This article is trus	45.21	67.806	.630	.857
Q15_4 Please rate the following statements:- This article is UNbi	45.98	65.788	.520	.866
Q15_5 Please rate the following statements:- This article is comp	45.43	67.602	.556	.862
Q19_1 Please rate the following statements:- This article is beli	44.82	68.831	.573	.861
Q19_2 Please rate the following statements:- This article IS accu	45.52	64.244	.683	.851
Q19_3 Please rate the following statements:- This article is trus	45.36	65.326	.711	.850
Q19_4 Please rate the following statements:- This article is NOT	45.89	62.980	.624	.857
Q19_5 Please rate the following statements:- This article is comp	45.72	66.902	.554	.862

Credibility

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2.20	1	.3	.3	.3
	2.60	1	.3	.3	.7
	2.70	2	.7	.7	1.3
	2.90	2	.7	.7	2.0
	3.00	1	.3	.3	2.3
	3.20	1	.3	.3	2.7
	3.40	1	.3	.3	3.0
	3.50	6	2.0	2.0	5.0
	3.60	1	.3	.3	5.4
	3.70	1	.3	.3	5.7
	3.80	4	1.3	1.3	7.0
	3.90	6	2.0	2.0	9.0
	4.00	12	4.0	4.0	13.0
	4.10	9	3.0	3.0	16.1
	4.20	4	1.3	1.3	17.4
	4.30	11	3.7	3.7	21.1
	4.40	11	3.7	3.7	24.7
	4.50	12	4.0	4.0	28.8
	4.60	18	6.0	6.0	34.8
	4.70	14	4.7	4.7	39.5
	4.80	9	3.0	3.0	42.5
	4.90	13	4.3	4.3	46.8
	5.00	14	4.7	4.7	51.5
	5.10	16	5.4	5.4	56.9
	5.20	10	3.3	3.3	60.2
	5.30	9	3.0	3.0	63.2
	5.40	17	5.7	5.7	68.9
	5.50	9	3.0	3.0	71.9
	5.60	3	1.0	1.0	72.9
	5.70	5	1.7	1.7	74.6
	5.80	18	6.0	6.0	80.6
	5.90	11	3.7	3.7	84.3
	6.00	7	2.3	2.3	86.6
	6.10	6	2.0	2.0	88.6
	6.20	9	3.0	3.0	91.6
	6.30	5	1.7	1.7	93.3
	6.40	2	.7	.7	94.0
	6.50	2	.7	.7	94.6
	6.60	1	.3	.3	95.0
	6.70	3	1.0	1.0	96.0
	6.80	3	1.0	1.0	97.0
	6.90	2	.7	.7	97.7
	7.00	7	2.3	2.3	100.0
	Total	299	100.0	100.0	

Figure 3:

Personal Involvement – Factor Analysis

Communalities

	Initial	Extraction
Q15_6 Please rate the following statements:- This article is very	1.000	.630
Q15_7 Please rate the following statements:- The article was very	1.000	.721
Q15_8 Please rate the following statements:-I enjoyed the articl	1.000	.620
Q15_9 Please rate the following statements:- The article is very	1.000	.697
Q19_6 Please rate the following statements:- This article is very	1.000	.555
Q19_7 Please rate the following statements:- The article was very	1.000	.677
Q19_8 Please rate the following statements:-I enjoyed the articl	1.000	.590
Q19_9 Please rate the following statements:- The article is very	1.000	.619

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.644	45.546	45.546	3.644	45.546	45.546
2	1.464	18.305	63.851	1.464	18.305	63.851
3	.921	11.510	75.361			
4	.778	9.725	85.086			
5	.388	4.856	89.941			
6	.345	4.313	94.254			
7	.264	3.301	97.555			
8	.196	2.445	100.000			

Extraction Method: Principal Component Analysis.

Component Matrix^a

	Component	
	1	2
Q15_6 Please rate the following statements:- This article is very	.413	.678
Q15_7 Please rate the following statements:- The article was very	.789	-.314
Q15_8 Please rate the following statements:-I enjoyed the articl	.761	.199
Q15_9 Please rate the following statements:- The article is very	.715	-.431
Q19_6 Please rate the following statements:- This article is very	.409	.622
Q19_7 Please rate the following statements:- The article was very	.806	-.165
Q19_8 Please rate the following statements:-I enjoyed the articl	.670	.376
Q19_9 Please rate the following statements:- The article is very	.703	-.354

Extraction Method: Principal Component Analysis.

a. 2 components extracted.

Figure 4:

Personal Involvement – Cronbach

Reliability Statistics

Cronbach's Alpha	N of Items
.798	8

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q15_6 Please rate the following statements:- This article is very	35.67	40.402	.387	.798
Q15_7 Please rate the following statements:- The article was very	32.90	40.531	.588	.766
Q15_8 Please rate the following statements:- I enjoyed the article	33.84	37.366	.645	.754
Q15_9 Please rate the following statements:- The article is very	32.66	42.582	.509	.778
Q19_6 Please rate the following statements:- This article is very	35.02	39.016	.367	.809
Q19_7 Please rate the following statements:- The article was very	32.89	40.068	.650	.759
Q19_8 Please rate the following statements:- I enjoyed the article	33.84	38.026	.573	.765
Q19_9 Please rate the following statements:- The article is very	32.72	41.745	.509	.777

Statistics

	Credibility	Personal Involvement
N Valid	299	299
Missing	0	0
Mean	5.0441	4.8131
Std. Deviation	.90074	.89041
Variance	.811	.793
Range	4.80	5.25
Minimum	2.20	1.75
Maximum	7.00	7.00

Personallnvolvement

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.75	1	.3	.3	.3
	1.88	1	.3	.3	.7
	2.25	1	.3	.3	1.0
	2.50	1	.3	.3	1.3
	2.63	2	.7	.7	2.0
	2.75	2	.7	.7	2.7
	3.13	3	1.0	1.0	3.7
	3.25	1	.3	.3	4.0
	3.38	2	.7	.7	4.7
	3.50	6	2.0	2.0	6.7
	3.63	5	1.7	1.7	8.4
	3.75	10	3.3	3.3	11.7
	3.88	10	3.3	3.3	15.1
	4.00	17	5.7	5.7	20.7
	4.13	11	3.7	3.7	24.4
	4.25	11	3.7	3.7	28.1
	4.38	13	4.3	4.3	32.4
	4.50	16	5.4	5.4	37.8
	4.63	14	4.7	4.7	42.5
	4.75	18	6.0	6.0	48.5
	4.88	23	7.7	7.7	56.2
	5.00	14	4.7	4.7	60.9
	5.13	17	5.7	5.7	66.6
	5.25	15	5.0	5.0	71.6
	5.38	12	4.0	4.0	75.6
	5.50	13	4.3	4.3	79.9
	5.63	11	3.7	3.7	83.6
	5.75	9	3.0	3.0	86.6
	5.88	6	2.0	2.0	88.6
	6.00	10	3.3	3.3	92.0
	6.13	5	1.7	1.7	93.6
	6.25	5	1.7	1.7	95.3
	6.38	5	1.7	1.7	97.0
	6.50	6	2.0	2.0	99.0
	6.63	1	.3	.3	99.3
	6.75	1	.3	.3	99.7
	7.00	1	.3	.3	100.0
Total		299	100.0	100.0	

Figure 5:

H1 – 1 Way ANOVA – Credibility DV, Groups IV

Descriptives

Credibility								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Group 1	99	4.9727	.85235	.08566	4.8027	5.1427	2.20	7.00
Group 2	104	4.9788	.89515	.08778	4.8048	5.1529	2.60	7.00
Group 3	96	5.1885	.94645	.09660	4.9968	5.3803	2.70	7.00
Total	299	5.0441	.90074	.05209	4.9416	5.1467	2.20	7.00

ANOVA

Credibility					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.950	2	1.475	1.828	.163
Within Groups	238.827	296	.807		
Total	241.777	298			

Multiple Comparisons

Dependent Variable: Credibility

Tukey HSD

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Group 1	Group 2	-.00612	.12613	.999	-.3032	.2910
	Group 3	-.21581	.12866	.216	-.5189	.0873
Group 2	Group 1	.00612	.12613	.999	-.2910	.3032
	Group 3	-.20970	.12713	.227	-.5092	.0898
Group 3	Group 1	.21581	.12866	.216	-.0873	.5189
	Group 2	.20970	.12713	.227	-.0898	.5092

Credibility

Tukey HSD^{a,b}

Group	N	Subset for alpha = 0.05
		1
Group 1	99	4.9727
Group 2	104	4.9788
Group 3	96	5.1885
Sig.		.209

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 99.558.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

H1: T-Test comparison

F-Test Two-Sample for Variances

	<i>Variable 1</i>	<i>Variable 2</i>
Mean	5.188541667	4.972727273
Variance	0.895762061	0.726493506
Observations	96	99
df	95	98
F	1.232993899	
P(F<=f) one-tail	0.15229753	
F Critical one-tail	1.399437837	

*Note Because Variance was higher in Group 3 than Group 1, switched groups as variables to properly do variance testing.

t-Test: Two-Sample Assuming Equal Variances

	<i>Variable 1</i>	<i>Variable 2</i>
Mean	4.972727273	5.188541667
Variance	0.726493506	0.895762061
Observations	99	96
Pooled Variance	0.809812225	
Hypothesized Mean Difference	0	
df	193	
t Stat	-1.674264816	
P(T<=t) one-tail	0.047849145	
t Critical one-tail	1.652787068	
P(T<=t) two-tail	0.095698289	
t Critical two-tail	1.972331676	

Figure 6:

H2. NS Clicks x Group. DV = Credibility

Between-Subjects Factors

	Value Label	N
ClickHyperlink	0 no	160
	1 yes	40
Group2	1.00 Group 2	104
	2.00 Group 3	96

Descriptive Statistics

Dependent Variable: Credibility

ClickHyperlink	Group2	Mean	Std. Deviation	N
no	Group 2	4.9459	.89689	85
	Group 3	5.2253	.91918	75
	Total	5.0769	.91529	160
yes	Group 2	5.1263	.89619	19
	Group 3	5.0571	1.05146	21
	Total	5.0900	.96895	40
Total	Group 2	4.9788	.89515	104
	Group 3	5.1885	.94645	96
	Total	5.0795	.92379	200

Tests of Between-Subjects Effects

Dependent Variable: Credibility

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power ^b
Corrected Model	3.165 ^a	3	1.055	1.241	.296	.019	3.722	.329
Intercept	3305.283	1	3305.283	3887.140	.000	.952	3887.140	1.000
ClickHyperlink	.001	1	.001	.001	.970	.000	.001	.050
Group2	.353	1	.353	.415	.520	.002	.415	.098
ClickHyperlink * Group2	.970	1	.970	1.140	.287	.006	1.140	.186
Error	166.661	196	.850					
Total	5330.090	200						
Corrected Total	169.826	199						

a. R Squared = .019 (Adjusted R Squared = .004)

b. Computed using alpha = .05

Figure 7:

H3 NS - Clicks by Group. DV = Personal Involvement

Between-Subjects Factors

		Value Label	N
ClickHyperlink	0	no	160
	1	yes	40
Group2	1.00	Group 2	104
	2.00	Group 3	96

Descriptive Statistics

Dependent Variable: PersonalInvolvement

ClickHyperlink	Group2	Mean	Std. Deviation	N
no	Group 2	4.6721	.99795	85
	Group 3	4.9050	.81239	75
	Total	4.7812	.92027	160
yes	Group 2	4.7368	.61787	19
	Group 3	4.6845	1.06332	21
	Total	4.7094	.86990	40
Total	Group 2	4.6839	.93784	104
	Group 3	4.8568	.87208	96
	Total	4.7669	.90873	200

Tests of Between-Subjects Effects

Dependent Variable: PersonalInvolvement

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power ^b
Corrected Model	2.355 ^a	3	.785	.950	.418	.014	2.849	.257
Intercept	2879.489	1	2879.489	3484.277	.000	.947	3484.277	1.000
ClickHyperlink	.193	1	.193	.234	.629	.001	.234	.077
Group2	.260	1	.260	.315	.575	.002	.315	.086
ClickHyperlink * Group2	.649	1	.649	.786	.377	.004	.786	.143
Error	161.979	196	.826					
Total	4708.953	200						
Corrected Total	164.334	199						

a. R Squared = .014 (Adjusted R Squared = -.001)

b. Computed using alpha = .05

Figure 8:

H4 – Chi Square (Group 2 x 3 BY Click)

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Group2 * ClickHyperlink	200	66.9%	99	33.1%	299	100.0%

Group2 * ClickHyperlink Crosstabulation

			ClickHyperlink		Total
			no	yes	
Group2	Group 2	Count	85	19	104
		Expected Count	83.2	20.8	104.0
		% within Group2	81.7%	18.3%	100.0%
Group 3	Group 3	Count	75	21	96
		Expected Count	76.8	19.2	96.0
		% within Group2	78.1%	21.9%	100.0%
Total	Total	Count	160	40	200
		Expected Count	160.0	40.0	200.0
		% within Group2	80.0%	20.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.406 ^a	1	.524	.597	.323
Continuity Correction ^b	.212	1	.646		
Likelihood Ratio	.405	1	.524		
Fisher's Exact Test					
Linear-by-Linear Association	.404	1	.525		
N of Valid Cases	200				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 19.20.

b. Computed only for a 2x2 table

Figure 9:

H5 – 3-way Chi Square (Group 2 & 3 with Click with Age)

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Group2 * ClickHyperlink * AgeCategory	200	66.9%	99	33.1%	299	100.0%

Group2 * ClickHyperlink * AgeCategory Crosstabulation						
AgeCategory				ClickHyperlink		Total
				no	yes	
Under	Group2	Group 2	Count	41	11	52
			Expected Count	42.0	10.0	52.0
			% within Group2	78.8%	21.2%	100.0%
	Group3	Group 3	Count	39	8	47
			Expected Count	38.0	9.0	47.0
			% within Group2	83.0%	17.0%	100.0%
	Total	Total	Count	80	19	99
			Expected Count	80.0	19.0	99.0
			% within Group2	80.8%	19.2%	100.0%
Over	Group2	Group 2	Count	44	8	52
			Expected Count	41.2	10.8	52.0
			% within Group2	84.6%	15.4%	100.0%
	Group3	Group 3	Count	36	13	49
			Expected Count	38.8	10.2	49.0
			% within Group2	73.5%	26.5%	100.0%
	Total	Total	Count	80	21	101
			Expected Count	80.0	21.0	101.0
			% within Group2	79.2%	20.8%	100.0%
Total	Group2	Group 2	Count	85	19	104
			Expected Count	83.2	20.8	104.0
			% within Group2	81.7%	18.3%	100.0%
	Group3	Group 3	Count	75	21	96
			Expected Count	76.8	19.2	96.0
			% within Group2	78.1%	21.9%	100.0%
	Total	Total	Count	160	40	200
			Expected Count	160.0	40.0	200.0
			% within Group2	80.0%	20.0%	100.0%

Chi-Square Tests						
AgeCategory		Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Under	Pearson Chi-Square	.272 ^a	1	.602		
	Continuity Correction ^b	.071	1	.790		
	Likelihood Ratio	.273	1	.601		
	Fisher's Exact Test				.621	.396
	Linear-by-Linear Association	.269	1	.604		
	N of Valid Cases		99			
Over	Pearson Chi-Square	1.903 ^d	1	.168		
	Continuity Correction ^b	1.286	1	.257		
	Likelihood Ratio	1.914	1	.166		
	Fisher's Exact Test				.221	.128
	Linear-by-Linear Association	1.884	1	.170		
	N of Valid Cases		101			
Total	Pearson Chi-Square	.406 ^a	1	.524		
	Continuity Correction ^b	.212	1	.646		
	Likelihood Ratio	.405	1	.524		
	Fisher's Exact Test				.597	.323
	Linear-by-Linear Association	.404	1	.525		
	N of Valid Cases		200			

- a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 19.20.
- b. Computed only for a 2x2 table
- c. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 9.02.
- d. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 10.19.

Figure 10:

By Gender

Between-Subjects Factors

	Value Label	N
Group	1	99
	2	104
	3	96
Gender	1 male	148
	2 female	151

Descriptive Statistics

Dependent Variable: credibility

Group	Gender	Mean	Std. Deviation	N
1	male	4.9422	.92527	45
	female	4.9981	.79444	54
	Total	4.9727	.85235	99
2	male	4.9672	.83780	61
	female	4.9953	.98076	43
	Total	4.9788	.89515	104
3	male	4.9381	1.04624	42
	female	5.3833	.81882	54
	Total	5.1885	.94645	96
Total	male	4.9514	.92099	148
	female	5.1351	.87393	151
	Total	5.0441	.90074	299

Tests of Between-Subjects Effects

Dependent Variable: credibility

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power ^b
Corrected Model	7.730 ^a	5	1.546	1.935	.088	.032	9.677	.651
Intercept	7443.991	1	7443.991	9319.018	.000	.970	9319.018	1.000
Group	2.197	2	1.099	1.375	.254	.009	2.750	.295
Gender	2.283	1	2.283	2.858	.092	.010	2.858	.392
Group * Gender	2.617	2	1.308	1.638	.196	.011	3.276	.345
Error	234.047	293	.799					
Total	7849.360	299						
Corrected Total	241.777	298						

a. R Squared = .032 (Adjusted R Squared = .015)

b. Computed using alpha = .05

Looking solely at women:

Tukey HSD results

pair	Q statistic	p-value
A vs B	0.0225	0.8999947
A vs C	3.2925	0.0550801
B vs C	3.1227	0.0731989

Figure 11:

By education

Between-Subjects Factors

		Value Label	N
Group	1		99
	2		104
	3		96
Education	1	Low	127
	2	High	172

Descriptive Statistics

Dependent Variable: credibility

Group	Education	Mean	Std. Deviation	N
1	Low	4.9109	.77121	46
	High	5.0264	.92094	53
	Total	4.9727	.85235	99
2	Low	5.1605	1.01143	38
	High	4.8742	.81057	66
	Total	4.9788	.89515	104
3	Low	5.4419	.96566	43
	High	4.9830	.88725	53
	Total	5.1885	.94645	96
Total	Low	5.1654	.93456	127
	High	4.9547	.86682	172
	Total	5.0441	.90074	299

Tests of Between-Subjects Effects

Dependent Variable: credibility

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power ^b
Corrected Model	10.253 ^a	5	2.051	2.595	.026	.042	12.976	.797
Intercept	7439.514	1	7439.514	9414.912	.000	.970	9414.912	1.000
Group	3.198	2	1.599	2.023	.134	.014	4.047	.416
Education	3.191	1	3.191	4.039	.045	.014	4.039	.517
Group * Education	4.219	2	2.110	2.670	.071	.018	5.340	.527
Error	231.524	293	.790					
Total	7849.360	299						
Corrected Total	241.777	298						

a. R Squared = .042 (Adjusted R Squared = .026)

b. Computed using alpha = .05

Looking at less-educated:

Tukey HSD results

pair	Q statistic	p-value
A vs B	1.7605	0.4309745
A vs C	3.8697	0.0193795
B vs C	1.9533	0.354745

(Note: Less is defined as less than a bachelor's degree.)

Figure 12:

By income

Between-Subjects Factors

	Value Label	N
Group	1	99
	2	104
	3	96
Income	low	156
	high	143

Descriptive Statistics

Dependent Variable: credibility

Group	Income	Mean	Std. Deviation	N
1	low	4.9369	.87671	65
	high	5.0412	.81207	34
	Total	4.9727	.85235	99
2	low	5.1021	.85165	48
	high	4.8732	.92530	56
	Total	4.9788	.89515	104
3	low	5.2907	.92603	43
	high	5.1057	.96345	53
	Total	5.1885	.94645	96
Total	low	5.0853	.88920	156
	high	4.9993	.91417	143
	Total	5.0441	.90074	299

Tests of Between-Subjects Effects

Dependent Variable: credibility

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power ^b
Corrected Model	5.359 ^a	5	1.072	1.328	.252	.022	6.642	.468
Intercept	7333.041	1	7333.041	9088.063	.000	.969	9088.063	1.000
Group	2.802	2	1.401	1.736	.178	.012	3.473	.363
Income	.763	1	.763	.946	.332	.003	.946	.163
Group * Income	1.524	2	.762	.944	.390	.006	1.888	.213
Error	236.418	293	.807					
Total	7849.360	299						
Corrected Total	241.777	298						

a. R Squared = .022 (Adjusted R Squared = .005)

b. Computed using alpha = .05

(Note: Less is defined as \$40,000 per year or less.)

Figure 13:

By online usage

Between-Subjects Factors

		Value Label	N
Group	1		99
	2		104
	3		96
MediaUse	1	low	140
	2	high	159

Descriptive Statistics

Dependent Variable: credibility

Group	MediaUse	Mean	Std. Deviation	N
1	low	4.9314	.89599	35
	high	4.9953	.83389	64
	Total	4.9727	.85235	99
2	low	4.9339	.92263	59
	high	5.0378	.86453	45
	Total	4.9788	.89515	104
3	low	5.1304	.99306	46
	high	5.2420	.90826	50
	Total	5.1885	.94645	96
Total	low	4.9979	.93781	140
	high	5.0849	.86772	159
	Total	5.0441	.90074	299

Tests of Between-Subjects Effects

Dependent Variable: credibility

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power ^b
Corrected Model	3.616 ^a	5	.723	.890	.488	.015	4.449	.318
Intercept	7324.330	1	7324.330	9010.824	.000	.969	9010.824	1.000
Group	2.872	2	1.436	1.766	.173	.012	3.533	.369
MediaUse	.624	1	.624	.767	.382	.003	.767	.141
Group * MediaUse	.030	2	.015	.019	.981	.000	.037	.053
Error	238.161	293	.813					
Total	7849.360	299						
Corrected Total	241.777	298						

a. R Squared = .015 (Adjusted R Squared = -.002)

b. Computed using alpha = .05

(Note: More is defined as frequent use or higher of either local online or national online)

Figure 14:

By time spent

Between-Subjects Factors

	Value Label	N
Group	1	99
	2	104
	3	96
TimeSpent	1 less	118
	2 more	181

Descriptive Statistics

Dependent Variable: credibility

Group	TimeSpent	Mean	Std. Deviation	N
1	less	5.0115	.90081	26
	more	4.9589	.84044	73
	Total	4.9727	.85235	99
2	less	4.9740	.96380	50
	more	4.9833	.83570	54
	Total	4.9788	.89515	104
3	less	5.3381	1.05921	42
	more	5.0722	.84035	54
	Total	5.1885	.94645	96
Total	less	5.1119	.99212	118
	more	5.0000	.83573	181
	Total	5.0441	.90074	299

Tests of Between-Subjects Effects

Dependent Variable: credibility

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power ^b
Corrected Model	4.675 ^a	5	.935	1.156	.331	.019	5.778	.410
Intercept	6919.950	1	6919.950	8551.369	.000	.967	8551.369	1.000
Group	3.106	2	1.553	1.919	.149	.013	3.839	.397
TimeSpent	.719	1	.719	.888	.347	.003	.888	.156
Group * TimeSpent	1.003	2	.501	.620	.539	.004	1.239	.153
Error	237.102	293	.809					
Total	7849.360	299						
Corrected Total	241.777	298						

a. R Squared = .019 (Adjusted R Squared = .003)

b. Computed using alpha = .05

(Note: Less is defined as less than 30 seconds, on average, for each story.)

Figure 15:

Coal story

One-way anova

Treatment →	A	B	C	Pooled Total
observations N	99	104	96	299
sum $\sum xi$	495.2	526.8	505.2	1,527.20
mean \bar{x}	5.002	5.0654	5.2625	5.1077
sum of squares $\sum x^2i$	2,560.56	2,760.48	2,754.64	8,075.68
sample variance s^2	0.8526	0.8935	1.0108	0.9235
sample std. dev. s	0.9234	0.9453	1.0054	0.961
std. dev. of mean $SE\bar{x}$	0.0928	0.0927	0.1026	0.0556

source	sum of squares SS	degrees of freedom ν	mean square MS	F statistic	p-value
treatment	3.5923	2	1.7962	1.9574	0.1431
error	271.62	296	0.9176		
total	275.2123	298			

Tukey HSD results

pair	Q statistic	p-value
A vs B	0.6662	0.8747174
A vs C	2.6847	0.1409769
B vs C	2.0561	0.3153497

Figure 16:

Drug story:

One-way anova

Treatment →	A	B	C	Pooled Total
observations N	99	104	96	299
sum $\sum xi$	489.4	508.8	491	1,489.20
mean \bar{x}	4.9434	4.8923	5.1146	4.9806
sum of squares $\sum x^2i$	2,515.72	2,600.08	2,640.44	7,756.24
sample variance s^2	0.9837	1.0764	1.3598	1.138
sample std. dev. s	0.9918	1.0375	1.1661	1.0668
std. dev. of mean $SE\bar{x}$	0.0997	0.1017	0.119	0.0617

source	sum of squares SS	degrees of freedom ν	mean square MS	F statistic	p-value
treatment	2.6708	2	1.3354	1.1748	0.3103
error	336.4567	296	1.1367		
total	339.1275	298			

Tukey HSD results

pair	Q statistic	p-value
A vs B	0.483	0.8999947
A vs C	1.5849	0.5030815
B vs C	2.0832	0.3059194