

RUNNING HEAD: WHO TAUGHT ME THAT?

**Who Taught Me That?**

**Blog Structure, Information Recall, and Source Identification**

by

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Changes in the information society, especially the rise of blogs and other citizen media, have refocused attention on questions of media modality, message recall, and source identification in online environments. The organization of information and commentary on political blogs, especially those focusing on critiques of mainstream news content, highlight novel issues of news information processing in mediated communication contexts, yet recalls earlier work on information structure and memory (Cohen, 1957; Haugtvedt & Wegener, 1994; Eveland et al., 2004). With the heightened intertextuality of the contexts through which we receive news, such as blogs and their repurposing of conventional news sources, the question of how information structure influences information processing becomes increasingly important.

A prevalent style adopted by political bloggers is to cite, quote, or hyperlink to a news story and then offer their own perspective (Farrell & Drezner, 2008; McKenna & Pole, 2008). Two contrasting modes exist for the presentation of these intersecting texts: (1) global presentation of the news story followed by comments or (2) interspersed, interruptive juxtaposition of news and comments. In this study we ask a set of interrelated questions. Does the way information is organized affect the subsequent encoding process by messages readers? And how does the motivation that readers bring to such communication contexts influence their recall and identification of information?

To address this question, two central news processing constructs are examined in this study: fact recall and source identification. This paper explores how the argument structure of blog commentary on press accounts influences information recall from these sources and readers' ability to correctly identify the source of this information. This may be particularly consequential among those who dedicate low levels of effort to message processing, for whom breaks in the flow of the news account may create barriers during encoding, which may be democratically

consequential when people rely on blogs for facts about public affairs without the proper cautionary caveats regarding the credibility of the source.

### **Fact Recall and Source Identification**

In a digital environment, where news can be repurposed and repackaged by bloggers, issues of fact recall and source identification are paramount. Most consequentially, journalists and bloggers abide by different standards of fact checking and different norms of objectivity. Individuals who encounter news information through blogs, especially in the form of blog commentary on referenced news texts, will have to navigate this more complex environment. For such individuals, it becomes important to study both of these elements of information acquisition to better understand not only what people are learning, but if they can remember and evaluate the credibility of the source of that information.

Probably the most common understanding of the factors underlying learning, fact recall is the extent to which readers correctly recollect information from the source. Successful recall hinges upon retrieval of information originally encoded in the memory. People engage in different models of message encoding (Hastie & Park, 1986). Different presentation formats may affect the way information is encoded and subsequent retrieved (Umanath & Scamell, 1988). When information is presented in a way that is analogous to knowledge representation, people are more likely to retain the information and show a better capability to recall it at a later time (Paivio, 1979). It is therefore possible that people will show a differential recall accuracy when information from multiple sources are presented in disparate ways. For instance, when information from two different sources are displayed in two separate chunks, people will encode information from the two perspectives in two areas whereas when two sources are integrated by means of arguments/issues, people will store the information in such format accordingly.

Equally important, although often ignored, source identification is defined as the ability of readers to accurately identify the original source in which certain information appears. Information recall and source identification seemingly go hand in hand; however, the latter relies on higher levels of attention than does fact recall (Johnson, Kounios, & Reeder, 1992). Under some circumstances, the two can be associated, while other times they are not (Johnson, Hashtroudi, & Lindsay, 1993). Although discrete from a psychological perspective, these two components of citizen processing of news information go hand-in-hand from a normative standpoint.

Even though no previous studies have studied these two constructs in the context of political blogs, some scholars have investigated how different message formats can alter the audience's ability to correctly recall information and identify sources. For example, Yeghyan and Grabe (2007) examined how three types of television messages affect source identification: conventional political ads, news-like political ads, and news stories. They found no immediate difference in source identification among the three formats; however, a week later, subjects were more likely to attribute information from news-like ads to news. In another study, Mares (1996) manipulated the visual similarity of news and fictional content and found evidence for both fiction-to-news and news-to-fiction source confusion. These studies demonstrate the ability of message structure to impact source identification, which in turn has important implications for the study of communication effects in a digital media environment.

Studies on source identification draw heavily upon the source monitoring framework (Johnson, 1997; Johnson et al., 1993). Source monitoring is defined, in the words of Johnson and his colleagues (1993), as "the set of processes involved in making attributions about the origins of memories, knowledge, and beliefs" (p. 3). This framework pinpoints two crucial criteria

influencing correct identification: memory for characteristics of the event and schematic (or prior) knowledge. In particular, Johnson et al. (1993) suggested that the most important memory characteristics are records of perceptual information, contextual information (such as spatial information), and cognitive operations (such as records of organizing) that are established at the time of memory formation. The ways political bloggers refer back to news articles, either through global presentation or interspersed format, differ along all of the aforementioned dimensions. For this reason, we next consider prior research that speaks to the power of these two presentation formats to elicit different memory processes.

### **Structure**

Of course, blogs present a context in which the failure to observe a consistent relationship between fact recall and source identification becomes particularly consequential. A growing value of blogs is their ability to comment on news stories and serve as a “watch dog” to traditional media and elites (Kaye 2005), often leading them to fuse together blogger’s commentary with traditional media content. They also provide a strong partisan perspective in a media landscape largely defined by norms of objectivity (Kovach & Rosensteil, 2001; Cunningham, 2003). Last, and perhaps the most consequential, differences in norms of objectivity and factual accuracy converge with these previous factors to highlight the issue of structure and the optimal organization of information for citizen competence.

The structure of information has long been studied ‘off line’. Asch (1946) first highlighted the impact of information order on personal judgments. He found that information presented first in a sequence was given more weight than information presented last, a phenomenon that has come to be known as the primacy effect. Conversely, the recency effect stipulates that information at the end of a long sequence can be weighted more, especially by

people with low need for cognition (Kassin et al., 1990). The widely studied topics of primacy and recency effects demonstrate the importance of information order in conveying information. But these effects may not be always studied separately. A structural element that can combine these effects is the “chunking” of information (Petty et al., 2001). Chunked information is defined as information clearly blocked or grouped into segments corresponding to valence, which allow readers to know when one set of information was ending and another beginning. On the other hand, unchunked information does not explicitly alter readers to a change in message valence. Research suggests that either primacy and recency effects can arise, depending upon whether the information is chunked, as well as differences in individual factors like need for cognition (Petty et al., 2001). The concept of “chunking” is useful in demonstrating that in addition to ordering information, the grouping of certain ideas can impact how participants make sense of the information milieus that they encounter.

Moving beyond these traditional “offline” studies of information structure, more recent studies have taken advantage of the unique environment provided online by investigating structural differences on the Internet. For example, Tewsbury and Althaus (2000) found the differing structures of *The New York Times* and *The Times on the Web* impacted how much information participants could recall. Although content remain consistent between the two *New York Times* versions, information recall was highest for people reading the print version. In regards to the structure of the Internet, Eveland and Dunwoody (2001) developed the theory of structural isomorphism, which claims that the structure of the Internet has the ability to mimic the associative nature of the human memory. Hyperlinks, for example, prompt readers to ask “how are these two things related?” thus enacting the node-link structure of the human memory (Eveland & Dunwoody, 2002). In their examination of website structure, Eveland, Cortese, Park,

and Dunwoody (2004) found a linear-print like design produced a higher level of factual knowledge, while participants in the more user-dependent hypertext structure were more able to convey a “denser” level of understanding. Their results indicate how information is presented can affect knowledge and understanding. Intriguingly, the condition which required more work from participants, the user-dependent design, did not produce a higher level of knowledge, but a denser level of understanding suggesting that perhaps motivation and ability may play a role in non-linear information structures.

However, news content made available on the Internet has been criticized for not capitalizing on the Internet’s unique characteristics (Barnhurst, 2002; Freedman 1997). The Internet is not confined by space or word counts, as newspaper content may; nor does it adhere to commercial breaks and time, as in the case of television news. As a result, the Internet has the ability to structure content in numerous ways. Recent research has focused on the structural and modal effects of online news sites (Eveland et al., 2004; Eveland, Seo, & Marton, 2004a; Tewksbury & Althaus, 2000), but as blogs become more prominent sources of political news (Rainie, Cornfield, & Horrigan, 2005) research needs to begin to explore the possible effects of blog structure on consequential outcomes.

A blogger can potentially create associations between pieces of information depending on its structure. For example, in a structure where the news story and blog commentary are intertwined, the blogger can link a specific aspect of the news story to a specific commentary, thus facilitating the naturally associations which structural isomorphism supports (see Evland & Dunwoody, 2001). In more global structures, distilling specific points of criticism may be not as obvious when the particular piece of new story information and the response commentary are embedded with larger, separate formats.

*Need for Cognition*

When looking at the ways in which people process information, research has consistently demonstrated that individual differences matter. Whether it is political ideology, interest, or ability, people differ in their ability and motivation to process information (Booth-Butterfield & Welbourne, 2002; Todorov, Chaiken, & Henderson, 2002; Chaiken, 1980, 1986; Petty & Cacioppo, 1979, 1986). One important individual difference that has been shown to influence reasoning and processing is need for cognition, or the “differences among individuals in their tendency to engage in and enjoy thinking” (Cacioppo & Petty, 1982, p. 116). People who are higher in need for cognition generally demonstrate a willingness to engage in effortful processing of material, as well as a greater enjoyment of navigating complex material (Cacioppo & Petty, 1982; Haugtvedt, Petty, & Cacioppo, 1992; Cacioppo, Petty, Feinstein, & Jarvis, 1996). Need for cognition appears to be a stable individual difference in people’s motivation to process information (Cacioppo & Petty, 1982; Cacioppo, Petty, Kao, & Rodriguez, 1986; Axsom, Yates, & Chaiken, 1987; Cacioppo et al., 1996).

But beyond simple differences in individual motivations, researchers are also interested in the contribution of need for cognition in explaining differences in the processing of media messages. People with a higher need for cognition generally rate themselves as having expended more effort on processing messages (Cacioppo et al., 1983, 1984, 1986) and have greater knowledge of relevant arguments and ideas (Haugtvedt & Petty, 1992; Cacioppo et al., 1983, 1986). Higher need for cognition has been linked to an information-orientation, in which individuals deliberately seek out self-relevant information (Berzonsky & Sullivan, 1992) and perceiving factual messages as more persuasive (Venkatraman, Marlino, Kardes, & Sklar, 1990). People with a higher need for cognition also seem more tolerant of ambiguity or closure to an

argument (Kardash & Scholes, 1996) and report less frustration with difficult tasks (Cacioppo & Petty, 1982).

These different effects of need for cognition may be linked to the processing strategies used in evaluating and interpreting new information. Using the Elaboration Likelihood Model, researchers suggest that individuals high in need for cognition are habitually more likely to use an effortful central route of processing, due to their enjoyment of thinking (Axsom et al., 1987; Haugtvedt & Petty, 1992; Haugtvedt et al., 1992; Priester & Petty, 1995) while those with a lower need for cognition are more likely to use peripheral cues, such as honesty or attractiveness, in their processing (Axsom et al., 1987; Haugtvedt et al., 1992). When offered a viable peripheral cue by which to make a decision, people with a lower need for cognition are more likely to use that cue to form their argument, compared to those high in need for cognition, who demonstrate the similar amounts of processing regardless of other cues (Priester & Petty, 1995). That said, individuals low in need for cognition can become motivated to use a more central route of processing, through increasing relevance or skepticism of peripheral cues (Axsom et al., 1987; Priester & Petty, 1995). Therefore, different cues in the content being examined prompt very different responses among those with low versus high need for cognition, with high need for cognition individuals defaulting to an effortful and central processing strategy, while those with a low need for cognition typically use more peripheral cues.

The more effortful processing that high need for cognition individuals demonstrate can also interact with the way information is presented to affect attitude formation and change. People with a high need for cognition demonstrate more effortful processing despite differences in cues that can discourage people with a low need for cognition (Axsom et al., 1987; Priester & Petty, 1995). One such difference may be differing effects of order or structure. In one example,

the impact of the order of presentation of ideas only affected the opinions of people with a lower need for cognition, while those with a higher need for cognition were unaffected by the order effects (Cohen, 1957). Further, an experiment on “chunking,” or breaking up information to allow time for consideration, produced different attitudinal effects on those with high and low need for cognition, with people who report a higher need for cognition demonstrating more effortful processing of the message, especially under the “chunked” condition (Petty et al., 2001). Thus, research suggests need for cognition could play an important role in how people process information, as well as play an important moderating role in determining the effects of structural changes.

### *Ideological Incongruence*

Need for cognition is not the only individual variable that can influence news processing of a media message. Instead, the identities people bring to their processing of a media message can interact with contextual changes in that message to prompt different processing techniques. For example, political ideology is one of the most salient characteristics people bring to the table, and it is likely to be heightened by coverage of a political policy debate, as well as by commentary by an ideological source (Rahn, 1993; Lau & Redlawsk, 2001). Political ideology and partisan identification have been linked to evaluations of news content, both for editorial coverage and “neutral” coverage (Eveland & Shah, 2003; Gunther, 1988; Dalton, Beck, & Huckfeldt, 1998). Therefore, examining whether a media message agrees or disagrees with a person’s ideological position could have strong effects on the motivation and ability of people to process that media message.

Ideological incongruence with a message can promote greater processing of the message, as people attempt to argue against incongruent information and selectively seek out congruent

information (Taber & Lodge, 2006; Edwards & Smith, 1996; Kunda, 1987, 1990; Ditto & Lopez, 1992; Lord, Ross, & Lepper, 1979). This effect has been observed in a variety of situations, from expressing skepticism of a negative health test result to stances on issues such as the death penalty and abortion (Kunda, 1987; Lord et al., 1979; Edwards & Smith, 1996). This process is characterized by not only more thorough and effortful attention to the message itself, but also a more careful search through memory for information that disconfirms the incongruent information (Kunda, 1990; Edwards & Smith, 1996). Ultimately, research into motivated processing suggests that people may be more engaged with incongruent or disconfirmatory information, given their desire to integrate the new information in such a way to match their previous beliefs and attitudes, thus avoiding the uncomfortable arousal associated with cognitive dissonance (Festinger, 1957). Therefore, given this greater attention and motivation to process, it seems likely that people faced with an ideologically incongruent message will show greater depth of processing than people exposed to a congruent message.

#### *Hypotheses and Research Questions*

Thus, while the Internet may provide changes to traditional format and structure, these changes may not affect everyone equally. When it comes to two different but equally important components of knowledge, fact recall and source identification, changes to structure online may be encouraging certain people, rather than others, to be accurately learning new information and recalling the source of that information. These differences may be linked to the ability of the structure of the Internet to more closely map onto people's memory models (Eveland & Dunwoody, 2001). But changes in people's motivation and/or ability to interpret information could greatly affect whether they are willing to put forth the effort to understand more difficult formats (Chaiken, 1980, 1986; Petty & Cacioppo, 1986), such as when a blogger's commentary

is interspersed with a news story, as compared to separately and globally critiquing the story. When these two authors, the news story and the blogger, are intertwined, we should see that motivation becomes especially important for recalling new information and its source. People with a higher need for cognition, given their enjoyment of complex tasks and engagement with the material (Cacioppo & Petty, 1982; Haugtvedt, Petty, & Cacioppo, 1992; Cacioppo et al., 1996) should be unaffected by these changes in structure, as they thoughtfully navigate the message, regardless of structure. On the other hand, those with a lower need for cognition will be less motivated to put forth the effort necessary to understand the material and thus should find the interspersed commentary much more confusing. Therefore, we hypothesize:

*H1a: Exposure to the interspersed blogger's commentary will significantly decrease total fact recall compared to the global blogger's commentary among people who are lower in need for cognition, but this difference will not be seen among people with higher need for cognition.*

*H2a: Exposure to the interspersed blogger's commentary will significantly decrease total source identification compared to the global blogger's commentary among people who are lower in need for cognition, but this difference will not be seen among people with higher need for cognition.*

But need for cognition is only one individual difference that may affect the motivation to process more complex material. A situational factor that could also produce changes in motivation is whether or not a message provides an ideologically congruent message or not. Research suggests that people engage in more effortful processing when faced with incongruent or disconfirmatory information, as they seek to bring the new ideas in line with their preconceived beliefs and attitudes (Taber & Lodge, 2006; Edwards & Smith, 1996; Kunda, 1987, 1990). This more

effortful, or “motivated” reasoning (Kunda, 1990) found when exposed to incongruent information should limit the effects of changes in structure, while this same motivation to carefully process will not be apparent with exposure to congruent information. Therefore, we propose:

*H1b: Exposure to the interspersed blogger’s commentary will significantly decrease total fact recall compared to the global blogger’s commentary among people who are exposed to ideologically congruent blogger’s commentary, but this difference will not be seen among people exposed to ideologically incongruent blogger’s commentary.*

*H2b: Exposure to the interspersed blogger’s commentary will significantly decrease total source identification compared to the global blogger’s commentary among people who are exposed to ideologically congruent blogger’s commentary, but this difference will not be seen among people exposed to ideologically incongruent blogger’s commentary.*

Of course, given that the message intertwines two separate sources – the newspaper and the blogger – it may be that fact recall or source identification mistakes are centered among one of these two sources, rather than the other. Differences in credibility between the two sources may play a role in this change: research suggests that opinionated language is perceived as less credibility (Hamilton & Hunter, 1998). While we would expect motivation to play the same moderating role in navigating structural content, we are unsure whether this process would be identical for blogger and newspaper fact recall and source identification. Therefore, we ask:

*RQ1a: Will interspersed versus global blogger’s commentary have the same interactive effects with need for cognition for both the newspaper and blogger fact recall?*

*RQ1b: Will interspersed versus global blogger’s commentary have the same interactive effects with ideological congruency for both the newspaper and blogger fact recall?*

*RQ2a: Will interspersed versus global blogger's commentary have the same interactive effects with need for cognition for both the newspaper and blogger source identification?*

*RQ2b: Will interspersed versus global blogger's commentary have the same interactive effects with ideological congruency for both the newspaper and blogger source identification?*

## **Methods**

The hypotheses were tested in two experiments embedded in web surveys among undergraduates at a large Midwestern university. In Study 1 ( $N=406$ ), fielded for two weeks in April 2007, a conservative blogger critiqued the story as adopting a liberal perspective. In Study 2 ( $N=471$ ), fielded for two weeks in May 2007, a liberal blogger critiqued the story as adopting a conservative perspective.

### *Study Design*

In both studies, respondents read a news story about global climate change policy written to emulate journalistic practice by providing a balanced summary of two positions on climate change policy. The article described both a liberal policy position for addressing climate change, endorsing mandatory caps on emissions, as well as a contrasting conservative position, supporting voluntary emissions reductions and technological innovation by industry (see Appendix 1 for full text of the news story). The news story was attributed to the Associated Press. The content of the news story remained consistent across all experimental conditions. The news story is followed by commentary from a political blogger. The way these comments are presented differs in these two experiments.

The study used a 2 (structure of presenting information) x 2 (ideological congruence) between-subjects design, where structure was manipulated and ideological congruence was

measured based on whether or not participants viewed messages that “matched” their political ideology<sup>1</sup>.

We embedded the policy news story in a post on a fictitious web blog authored by a blogger named “Curt.” The blog commentary was written to critique either the conservative or liberal policy positions as represented in the news story. The structure of the blogger’s commentary was presented as either “global” or “interspersed.” In the global condition, participants viewed the entire news story, followed by the blogger’s critique. In the interspersed condition, the content of the blogger’s commentary remained constant, but the interrupted the story and commented on specific chunks.

The ideological incongruence condition was created by comparing participants’ reported political party identifications with the ideology of the blogger’s critique. Participants who reported Democrat affiliation and viewed blogger commentary critiquing the conservative position on global warming policy were in the ideologically congruent condition, as were Republican participants who read blog critiques of liberal policy. Republicans who read critiques of the conservative position and Democrats who viewed critiques of the liberal position were considered to be in the ideologically incongruent condition. Participants who reported either “Independent” or third party affiliation were excluded from the analysis.

### *Measures*

*Fact recall.* Fact recall was measured by asking participants to complete six multiple choice questions on specific facts in the stimuli (See Appendix II for exact question wording). Items were summated to create a total fact recall index ( $M=2.87$ ,  $SD=1.33$ ,  $Max=5.00$ ,  $\alpha=.44$ ).

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<sup>1</sup> This 2x2 design was extracted from a larger experimental design. The full design included a third manipulation related to the civility of the blog post where consistent commentary included either civil or uncivil references to opponents. Civility is included as a covariate in this analysis.

The questions on newspaper content ( $M=1.59$ ,  $Max=3.00$ ,  $SD=.96$ ,  $Max=5.00$ ,  $\alpha=.30$ ) and blogger comments ( $M=1.27$ ,  $Max=2.00$ ,  $SD=.70$ ,  $r=.06$ ) were separated for follow-up analysis.

*Source Identification.* The source identification score was created by asking participants to correctly identify where a series of statements originate from: the newspaper or blogger comments. Items were summated to create a total source identification index ( $M=4.38$ ,  $Max=8.00$ ,  $SD=1.88$ ,  $\alpha=.55$ ). The information from the newspaper story ( $M=2.40$ ,  $Max=4.00$ ,  $SD=1.09$ ,  $\alpha=.35$ ) and blogger comments ( $M=1.98$ ,  $Max=1.98$ ,  $SD=1.16$ ,  $\alpha=.38$ ) were separated for follow-up analysis.

*Need for cognition.* This construct was measured by two items on an 11-point scale from 0 (strongly disagree) to 10 (strongly agree) and they were averaged to create a need for cognition index ( $M=6.10$ ,  $SD=1.88$ ,  $r=.50$ ,  $p<.001$ ).

## Results

To test our hypotheses and research questions, we used a series of three-way ANCOVAS. In each of these tests, both the civility of the blogger's commentary and respondent's level of general media trust are controlled. Our first set of hypotheses looked at the interaction of structural changes with need for cognition and ideological incongruence on total fact recall. We find no support for any of our hypotheses about fact recall. Neither need for cognition (H1a) nor ideological incongruence (H1b) interact with changes in structure to affect total fact recall.

Our second set of hypotheses looked at the effects of the intersection of need for cognition and ideological incongruence with structure on total source identification. H2a predicted that we would see an interaction between need for cognition and structure. The data support this hypotheses ( $F(2, 772)=5.333$ ,  $p=.021$ ). Specifically, our hypotheses suggested that differences in structure would be apparent only among those with a lower need for cognition not

among those with a higher need for cognition. Post hoc analyses suggest this is the case: among people with a low need for cognition, people who viewed the interspersed blogger's commentary were significantly less likely ( $p=.007$ ) to correctly identify the source of the information ( $M=4.07$ ) compared to those who saw the global blogger's commentary ( $M=4.56$ ), while no significant difference was apparent between global ( $M=4.43$ ) and interspersed ( $M=4.54$ ) commentary for those with a higher need for cognition. Thus, H2a was supported.

[Insert Figure 1 here]

Further, H2b predicted that we would find a significant interaction between ideological incongruence and structure. Beyond a main effect for ideological incongruence ( $F(1, 772)=5.193$ ,  $p=.023$ ), the data support this hypothesis of a significant interaction ( $F(2, 772)=6.619$ ,  $p=.01$ ). To test the specifics of this hypothesis, namely that the significant difference would be centered among those exposed to congruent (rather than incongruent) blogger's commentary, we performed a pairwise comparison. The results again support the hypothesis: for people exposed to the ideologically congruent message, an interspersed structure significantly ( $p=.005$ ) decreased source identification ( $M=3.99$ ) compared to a global structure ( $M=4.51$ ), while no differences were seen among those exposed to incongruent commentary between the interspersed ( $M=4.63$ ) and global ( $M=4.48$ ) structure. Thus, H2b was supported.

[Insert Figure 2 here]

Of course, we are also interested in whether the pattern remains the same for both the blogger's commentary and the news story. Our first set of research questions asks whether need for cognition and ideological incongruence have the same interactive effect with structure for fact recall for both the blogger's commentary and the newspaper story. Separate ANCOVAs were run, testing fact recall for the blogger's commentary and for the newspaper story. Much like total

fact recall, we find no significant effects of the interaction between structure and need for cognition or ideological incongruence on fact recall in either condition. In other words, fact recall for both the blogger's commentary and for the newspaper article appears unaffected by changes in structure, even when taking motivations (such as need for cognition and ideological incongruence) into account.

Our next set of research questions asked whether the interaction between motivation and structure to functions the same for newspaper and blogger source identification. To test these question, we again ran a series of three-way ANCOVAs to look at the interaction between structure and need for cognition or ideological incongruence. For newspaper source identification, the interaction between need for cognition and structure is reduced to marginal significance ( $F(2, 772)=2.735, p=.099$ ). Given that our prediction was specifically about the difference among those low in need for cognition, we looked at the pairwise comparison to see if this difference we perceived for total source identification held for newspaper source identification. We see a similar pattern: among those with a low need for cognition, an interspersed structure significantly decreases ( $p=.011$ ) newspaper source identification ( $M=2.26$ ) compared to a global structure ( $M=2.53$ ), while the difference among those with a higher need for cognition is not statistically significant for the interspersed ( $M=2.42$ ) versus global ( $M=2.44$ ) structure.

We also look at the ANCOVA for blogger's source identification to investigate this interaction between need for cognition and structure. For blogger identification, the interaction is again significant ( $F(2,772)=4.693, p=.031$ ). However, looking specifically at the pairwise comparisons, we find that among those with a lower need for cognition, the interspersed commentary only marginally ( $p=.051$ ) decreases correct blogger source identification ( $M=1.81$ )

compared to the global commentary ( $M=2.03$ ), although we again see no difference among those with a higher need for cognition between the interspersed ( $M=2.12$ ) and global ( $M=1.99$ ) structure.

[Insert Figures 3 & 4 here]

Next, we test the interaction between ideological incongruence and structure against both newspaper and blogger source identification. For newspaper source identification, we again see a marginal overall interaction ( $F(2,772)=3.45$ ,  $p=.064$ ), but we again look to the specific predicted pairwise comparison. Following the same pattern, we see a significant difference in the ideologically congruent condition ( $p=.008$ ) between the interspersed ( $M=2.25$ ) and global ( $M=2.54$ ) structure, while this difference is not significant for the higher need for cognition individuals – interspersed ( $M=2.43$ ) and global ( $M=2.43$ ) structures.

Looking at blogger source identification, we again see a significant interaction between ideological incongruence and structure ( $F(2,772)=5.756$ ,  $p=.017$ ). The pairwise comparison suggests that among those exposed to an ideological congruent message, the interspersed structure ( $M=1.73$ ) significantly decreased blogger source identification ( $p=.039$ ) compared to the global structure ( $M=1.98$ ), while among those exposed to an ideological incongruent message, the difference between the interspersed ( $M=2.20$ ) and global ( $M=2.05$ ) structure is not significant, thus fitting the overall pattern observed.

[Insert Figures 5 & 6 here]

## **Discussion**

This paper provides a preliminary exploration of how structural differences online, specifically the more intermingled structure of blogs, can affect people's learning from the sources available. This study suggests that while changes in format do not significantly affect

people's fact recall from either the blogger or the news article, it can affect their ability to correct identify from where they got the information. Among people with a high motivation to process, specifically those with a higher need for cognition or those confronted with ideologically incongruent messages, the change of structure, from a global and more clear distinction between news article and blogger's commentary to an interspersed format, with the blogger interrupting the news story with critiques, does not affect their ability to correctly identify information. For those who are motivated to do so, they are still able to navigate the more complex structure offered online. This pattern seems to hold for their ability to correctly identify both the information as coming from the newspaper and from the blogger – in other words, they are not more likely to misidentify information from either source, but can correctly identify both.

On the other hand, not everyone is motivated by individual differences or contextual circumstances to thoroughly and carefully process incoming information. For these people, a more interspersed structure, with the blogger's commentary intertwined with the newspaper article, made it much more difficult to identify from where they are getting their information. A more interspersed structure decreased their total source identification compared to a more global (and easier) structure. Again, this difficulty seemed to arise equally for identifying the newspaper information and the blogger's commentary.

Therefore, this study suggests that the new information environment online, in which objective news content is often juxtaposed with opinionated commentary, can have important implications for people's information processing strategies. As political blogs often use traditional media sources as a platforms upon which to critique and comment (McKenna & Pole, 2008), it is democratically necessary to consider whether people can distinguish between the objective news content and opinionated commentary in forming their opinion. If people are

confused about the source of their information, they may be unable to accurately judge its credibility or appropriately integrate into their existing information structures.

In our information society, message structure is changing rapidly. In the political blogosphere, information is not portrayed in a linear, compartmental structure; instead, neutral reporting and ideological commentary are mixed, often in highly interruptive ways (McKenna & Pole, 2008). The results here suggest that an interspersed structure may hinder the process of correctly identifying the source of information among those less engaged in processing – those low in need for cognition or in an ideologically congruent message environment. The fact that this is coupled with no difference in level of information recall suggests that blogs contribute to knowledge equally among people who differ significantly in their ability to identify the source of the information they hold and in their level of skepticism toward the source of that information. If an interspersed structure suppresses source identification and skepticism among low information processors, they may be accepting information as factual without carefully considering its merits. This may have important implications for democratic functioning and decision-making given the changing nature of online news environments.

However, there are several important limitations to consider involving the study manipulations and sample. For example, ideological incongruence was intended to measure the disparity between the blogger's comments and the respondent's own opinion. The construction of this measure was based on the answer to a party identification question and the assumption that the global warming issue falls along such lines. A more ideal measure would utilize a pretest question to directly gauge respondents' opinions on global warming.

Two more general limitations concern the use of a college sample of the issue of global warming. First, the use of a college sample does limit the ability to generalize to the population

at large. However, in studying blog effects it is important to note that several studies have found that blogger readers tend to be college educated (Kaye, 2005; Rainie, 2005; Gil de Zuniga, Vraga, Veenstra, Wang, DeShano, & Shah, 2007). Therefore, the use of a college sample may produce more accurate responses to those found in the blogosphere. Second, the issue of global warming could be of greater importance to a college sample and, consequently, our results indicative of the specific issue rather than the general manipulations. Future studies should make use of multiple issues when continuing to explore the effects of blog structure. The use of an issue which does not resonate as much with a college sample could corroborate results found here, and ensure our results are indicative of a structural change and not the interaction between the sample and issue.

Ultimately, this study points in an important new direction for media studies. Although the study of blogs has become more prevalent in mass communication theory (Gil de Zuniga et al., 2006; Farrell & Drezner, 2008; Kaye, 2005), an important thing to consider is the changing structure that blogs present and its implications for information processing. Blogs do not operate in a vacuum, but instead operate in tandem with traditional news media, often borrowing their content and repurposing it to advance their commentary (McKenna & Pole, 2008). Future research should develop this study's findings by looking more carefully at a variety of structures available online and different motivations that could encourage or discourage processing. If the structural differences between blogs are influencing people to accept information without carefully considering its source or its veracity, this could have important implications in a democracy that depends on a rational and thoughtful public.

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Figure 1: Effects of need for cognition and structure on total source identification

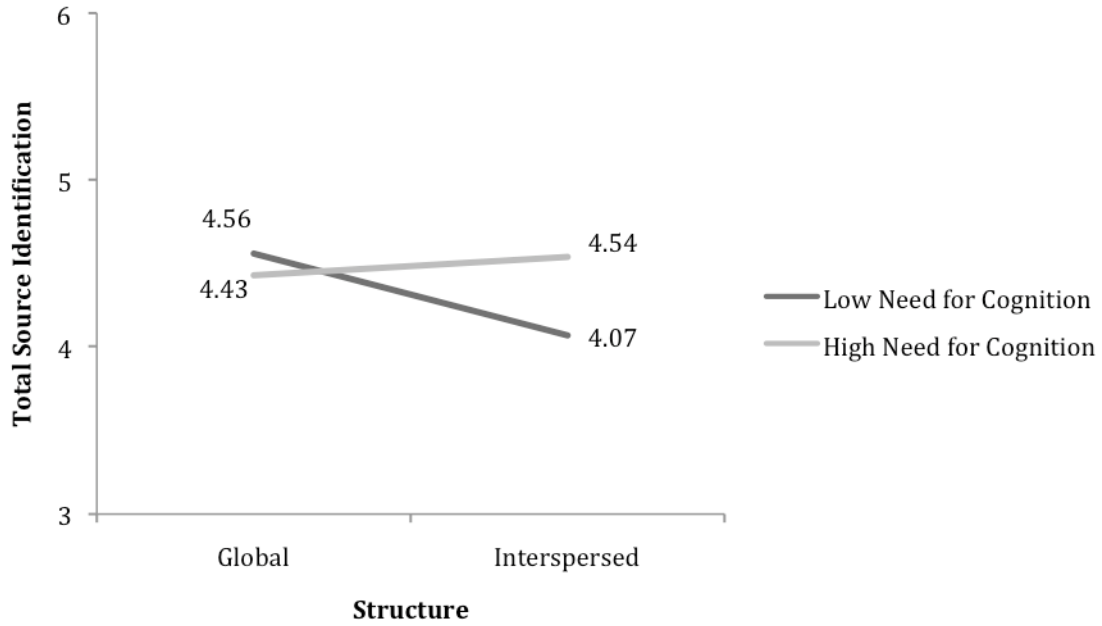


Figure 2: Effects of ideological incongruence and structure on total source identification

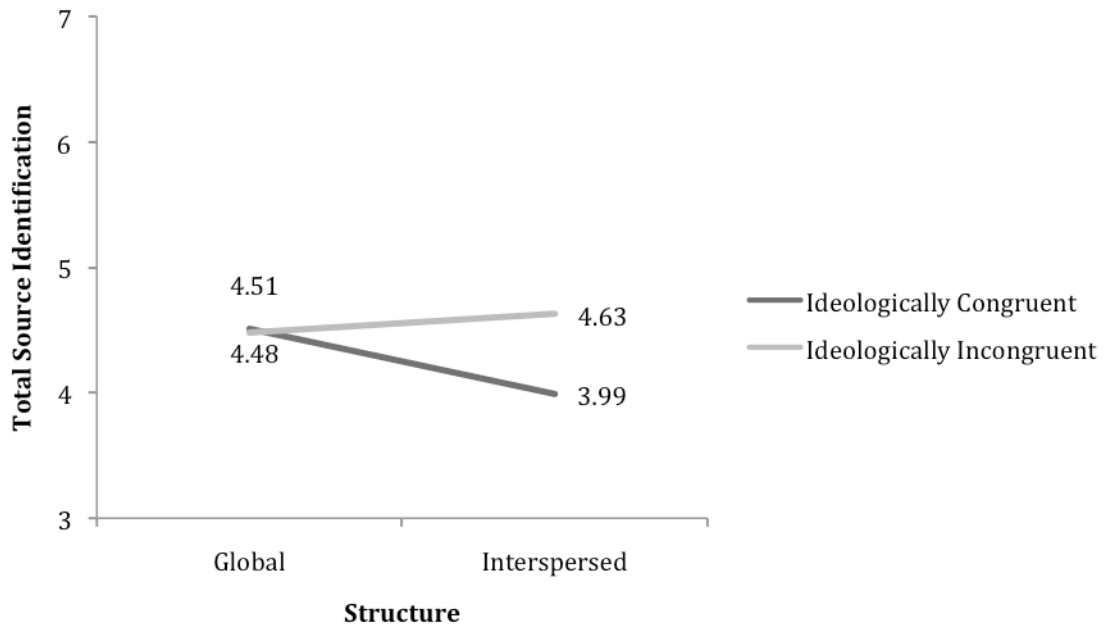


Figure 3: Effects of need for cognition and structure on newspaper source identification

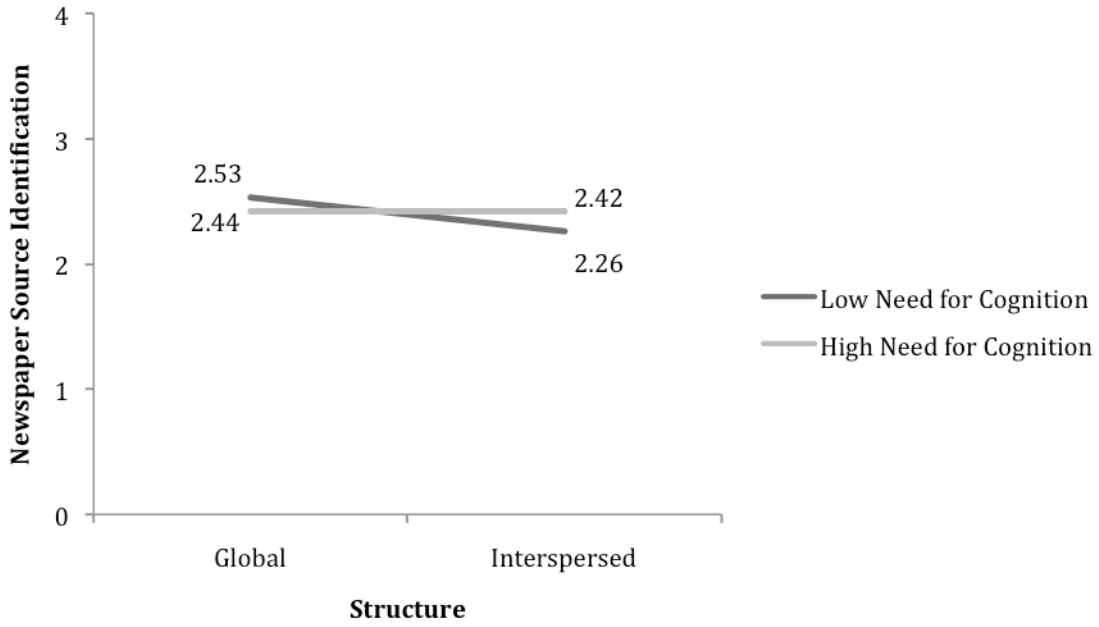


Figure 4: Effects of need for cognition and structure on blogger source identification

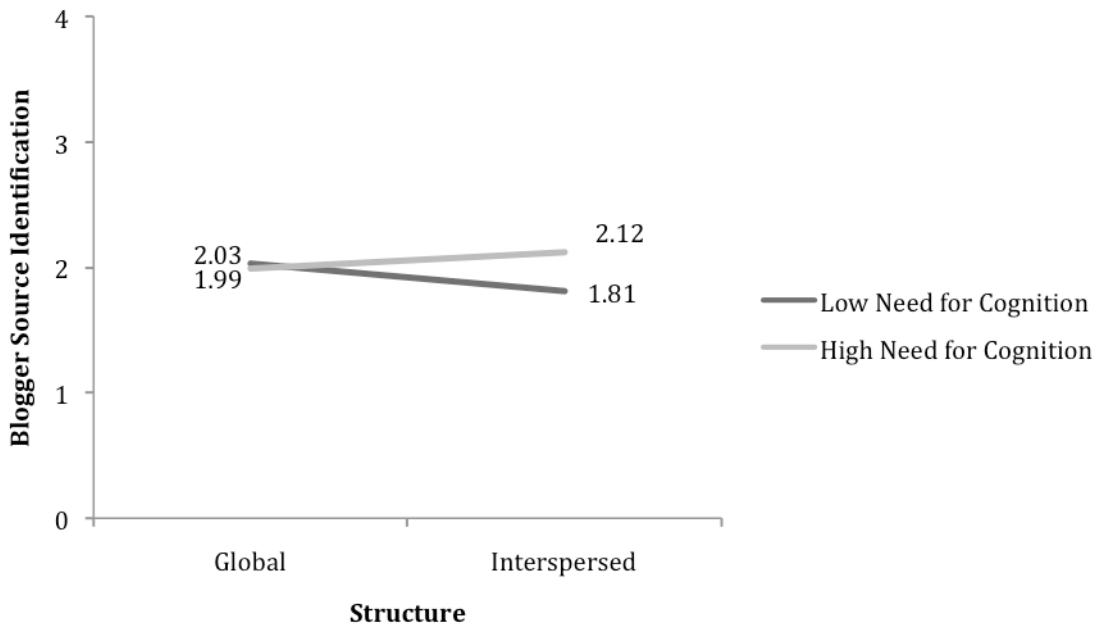


Figure 5: Effects of ideological incongruence and structure on newspaper source identification

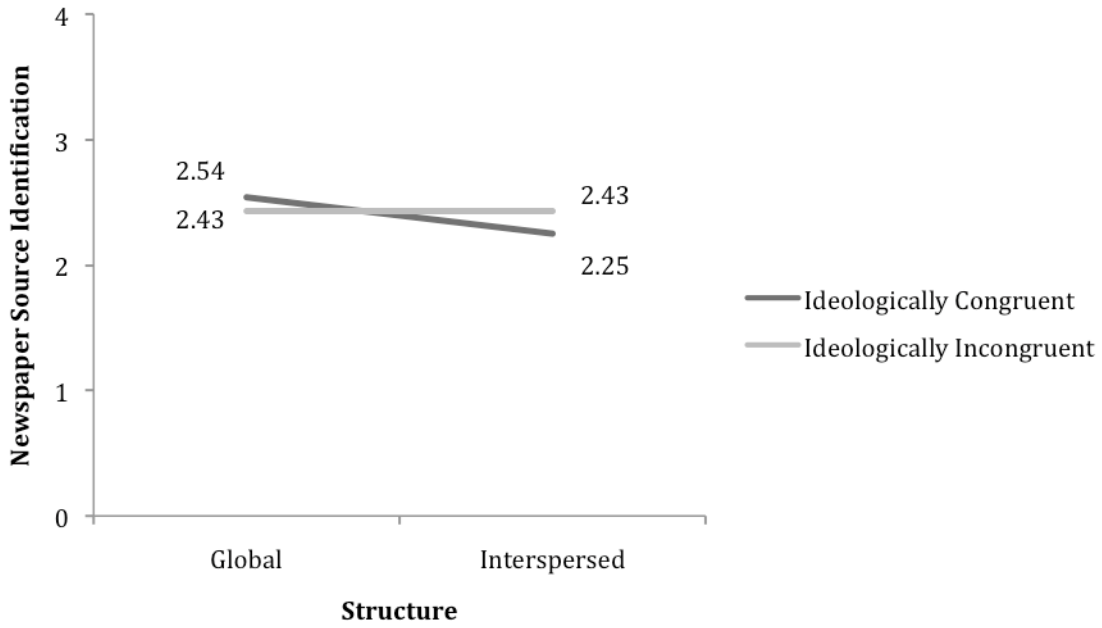
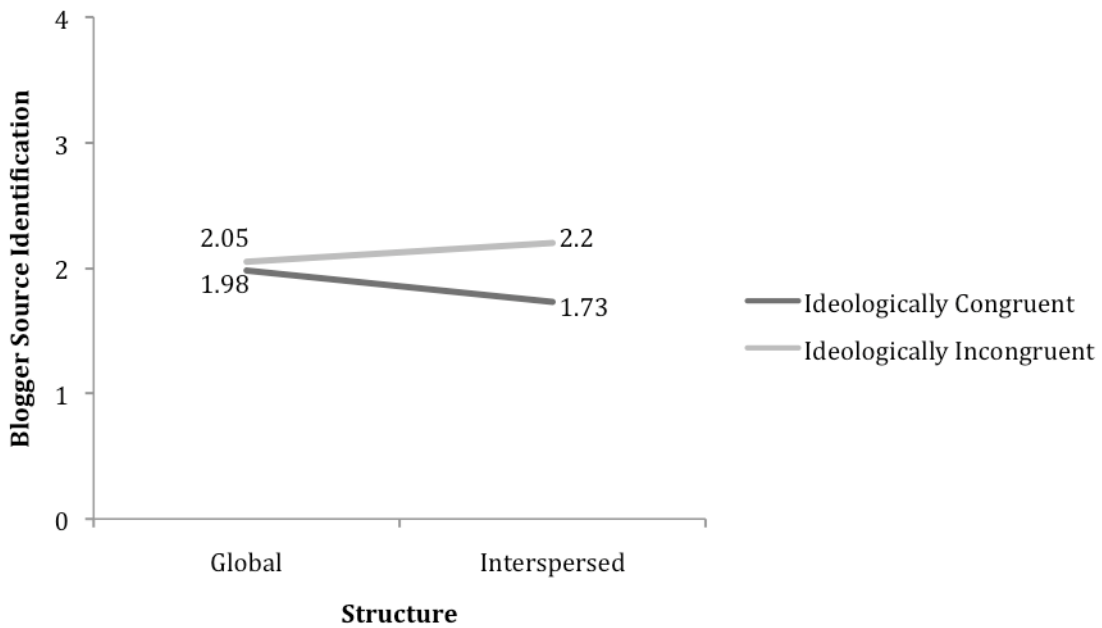


Figure 6: Effects of ideological incongruence and structure on blogger source identification



## Appendix I Experiment Stimuli

**HEADLINE:** Lawmakers debate competing proposals on global warming

WASHINGTON - Congress turned the spotlight on global warming this week for the first time in six years, promising to pass legislation to address climate change by year's end.

Lawmakers in the U.S. House of Representatives and Senate said there is growing agreement that Congress needs to address the problem of greenhouse gases causing global warming. There is less agreement, however, on how that should be done.

In a recent press conference, Rep. Mark Hunt, D-Colo., touted a plan that calls for mandatory caps on greenhouse emissions for power plants, industry and oil refineries. President Bush has opposed mandatory caps but has called for changes to federal fuel-efficiency standards for vehicles and a boost in ethanol production.

The Hunt plan, co-sponsored by Rep. Bill Reedy, D-Ky. would require releases of heat-trapping gases to return to 2004 levels by 2012 and to 1990 levels by 2020.

Carbon dioxide, produced from the burning of fossil fuels, is the primary greenhouse gas. United States emissions of this gas have increased an average of about 1 percent per year since 1990.

"With each passing year, the consequences of federal inaction on reducing greenhouse gas emissions become more devastating for our children and grandchildren, and the range of solutions grows smaller," Hunt said Thursday.

Conservatives such as Rep. Mike Donald, R-Kan., oppose strict limits on emissions, arguing that they would raise energy costs for consumers and hurt economic growth. "Carbon caps will hit hardest on those with the least ability to pay. Do we really want that?" he said.

President Bush, while acknowledging concerns about global warming, maintains that industry can deal with the issue through the development of new technologies.

The president has submitted a plan to combine technological innovations and voluntary efforts by industry to reduce emissions through energy conservation and the use of renewable fuels. These measures, administration officials say, are already well on their way to slowing the growth of greenhouse gases.

The Bush plan falls short of the mandatory reductions in greenhouse gas emissions envisioned by the 1997 Kyoto Protocol, which President Bush renounced in 2001. "We can get beyond . . . the pre-Kyoto era with a post-Kyoto strategy, the center of which is new technologies," he said on a visit Tuesday to a DuPont facility in Delaware.

Critics have questioned whether President Bush's proposals are the best way to address the problem of global warming.

"When you get to the bottom line, there are no hard caps, no enforcement mechanisms, and we aren't even going to start reversing the increase in carbon dioxide emissions in the transportation sector for 10 years," Hunt said.

The Bush administration believes that market forces will prove more efficient than government regulation. White House spokesman Tony Snow said, "Carrots work better than sticks."

## **Appendix II Question Wording**

### ***Need for Cognition (11-point scale)***

Here are some of the statements that people find useful in describing themselves. For each of them, please indicate how accurately it describes you.

I really enjoy a task that involves coming up with new solutions to problems.

I prefer complex problems to simple ones.

### ***Fact recall (Study 1)***

Please choose a correct answer in each following question, based on what you read before:

According to what you read before, in what year did President Bush renounce the Kyoto Protocol?

According to what you read before, in the United States emissions of Carbon dioxide have increased an average of about \_\_\_\_ per year since 1990.

According to what you read before, the Democrat plan will require a return to 2004 levels of greenhouse gas emissions by what year?

According to what you read before, a majority of the signatories of the Kyoto Protocol will meet or exceed their obligations under the treaty and reduce their greenhouse-gas emissions.

According to what you read before, how much will it cost per household to implement mandatory caps on greenhouse-gas emission?

### ***Fact Recall (Study 2)***

Please choose a correct answer in each following question, based on what you read before:

According to what you read before, in what year did President Bush renounce the Kyoto Protocol?

According to what you read before, in the United States emissions of Carbon dioxide have increased an average of about \_\_\_\_ per year since 1990.

According to what you read before, the Democrat plan will require a return to 2004 levels of greenhouse gas emissions by what year?

According to what you read before, a majority of the signatories of the Kyoto Protocol are making progress toward meeting their obligations under the treaty and reducing their greenhouse-gas emissions

According to what you read before, how much it will cost per household if we don't implement mandatory caps on greenhouse-gas emission?

### ***Source Identification (Study 1)***

According to what you just read, attribute each of the following statements to the appropriate source (news article or blogger's commentary)

Rep. Gill's proposal would require greenhouse-gas emissions to return to 2004 levels by 2012. (newspaper)

Rep. Gill's proposal would result in a 1-degree decrease in surface temperature by 2020. (blogger)

The Democratic proposal is estimated to cost \$2,600 per household per year. (blogger)

U.S. emissions of carbon dioxide have increased 1 percent per year since 1990. (newspaper)

It is uncertain whether global temperature increases are due to humans activity. (blogger)

Technological innovations and voluntary reductions have already begun slowing the growth

of greenhouse gases. (newspaper)

Most of the nations that signed the Kyoto accord have failed to meet its requirements. (blogger)

President Bush renounced the Kyoto accord in 2001. (newspaper)

***Source Identification (Study 2)***

According to what you just read, attribute each of the following statements to the appropriate source (news article or blogger's commentary)

Rep. Hunt's proposal would require greenhouse-gas emissions to return to 2004 levels by 2012. (newspaper)

Rep. Hunt's proposal would result in a 1-degree decrease in surface temperature by 2020. (blogger)

The Republican proposal is estimated to cost \$2,600 per household per year by 2020. (blogger)

U.S. emissions of carbon dioxide have increased 1 percent per year since 1990. (newspaper)

It is certain that global temperature increases are due to humans activity. (blogger)

Technological innovations and voluntary reductions have already begun slowing the growth of greenhouse gases. (newspaper)

A majority of Kyoto signatories have made progress toward reducing greenhouse gas emissions. (blogger)

President Bush renounced the Kyoto accord in 2001. (newspaper)

**Party Identification**

Which one of the following best describes your political affiliation?

Democratic Party; Republican Party; Libertarian Party; Green Party; Other