ENHANCED VS. UNDIFFERENTIATED TEXT: A STUDY TO ASSESS THE EFFECTS ON READERS

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Abstract

Though most current business writing standards recommend using headings, visuals, and other enhancements, knowledge about the effect of these techniques has largely been based on retrospective comprehension analyses. To explore how these techniques affect reader processing, this study uses verbal protocol analysis to assess the effects of four message-enhancement techniques: (1) headings, (2) agendas, (3) approach, and (4) visuals. Research subjects read and responded to documents designed to isolate the effects of these techniques, and in each case the enhanced text significantly affected reader processing. Headings increase positive responses and reader understanding by eliminating content-related questions, minimizing confusion, and encouraging processing techniques. Agendas add clarity and organization by helping readers predict, order, and reflect on arguments. An indirect approach persuades more readers to agree with a controversial idea than a direct approach. And visuals help readers to focus on important data, explain concepts, and get an overall feeling for the document by jumping, causing better understanding and more thorough reviews. These results will help writers, as well as teachers of writing, to be more effective in their use of message-enhancement techniques.

Background

A significant body of research has focused on achieving effective readability at the sentence and paragraph level of writing (Douglas, 2008). The current research seeks to build on this basic literature and, instead, target four text-enhancement tactics and strategies that are often used to make documents more reader friendly: headings, agendas (a preview schema embedded early in the text), visuals, and direct structure (Baker, 2001; Sharp, 1993).

Most writing-analysis studies examine the text directly, using various textual-analysis methods, or use reader-comprehension and recall tests as their independent variables (Vaiana & McGlynn, 2002; Sharp, 1993). This study instead uses verbal protocol analysis (VPA) and seeks to peek inside the reader's brain and analyze the mental processing of the text. VPA results in richer and more accurate conclusions about the effects of enhanced text (Smagorinsky, 1989).   As a result of this study, assumptions about the importance of message enhancements can be verified by actual reader responses that identify the exact effect of each message-enhancement technique. Through the use of VPA, writers, as well as teachers of writing, can have greater confidence in their use of various message-enhancement techniques and strategies.

Verbal protocol analysis, the use of verbal self-reporting during text processing, has matured into a useful tool for understanding cognitive processes since its entrance into the academic view in 1980. In that year, K. Anders Ericsson and Herbert A. Simon of Cambridge University published their proposal on

the validity of these protocols as data, a methodology that had been used by other scholars for almost a century (Pressley & Afflerbach, 1995; Weisberg & Fleck, 2004).

In 1981, Linda S. Flower and John R. Hayes (1981) published a benchmark study, *A Cognitive Process Theory of Writing*. This pioneer effort was one of the first to gather data through the use of protocols, or transcripts from dictation sessions by test subjects as they worked through an assigned task, as data. The authors used the theory of verbal protocol analysis to analyze the different mental processes of professional and amateur writers. Both groups were given the same writing prompt and were asked to think out loud as they wrote, verbalizing everything that went through their minds. The transcriptions of the recordings were then analyzed and compared, creating a comprehensive overview of the mental steps each group took before and during the writing process (Flower & Hayes, 1981).

Since the Flower-Hayes experiment, dozens of other researchers have used verbal protocol analysis to glean more comprehensive and accurate information than can be gained from end-of-study surveys (Smagorinsky, 1989). The verbal protocol approach asks subjects to "think aloud" while completing a task, giving insights into concurrent mental processes instead of retrospective analyses, which are considered incomplete and often inaccurate (Ericsson & Simon, 1993). Subsequent decades of research have placed protocol analysis as one of the principal methods for studying thinking in various psychological fields as well as applied settings, such as studies of text comprehension, user testing of computer software, and survey design (Ericsson, 2002).

Literature Review

The first glance at a document produces in the reader's mind an initial impression, whether positive or negative. Seeking to determine what non-text elements affect the first impression, McCabe, Kraemer, Miller, Parmar, and Ruscica (2006) compared several documents with varying font sizes, uses of headings, and margin sizes. Study participants perceived that passages containing headings and larger font size would be easiest to comprehend, with no preference for margin size. Hartley and Trueman dove deeper into headings research by juxtaposing the position and nature of the headings, and then testing readers afterwards on their recall. Their results claimed that headings aid text comprehension (Hartley & Trueman, 1985).

In research by Spyridakis and Standal (1987), three different types of *signals* were the subject of the investigation: previews, headings, and logical connectives. All three types of signals had some positive effect in some cases, but the results were not consistent across all different types of documents. Important to note is that there were no negative effects from the use of signals. Brooks, Dansereau, Spurlin, and Holley (1983) studied the effects of headings and outlines on comprehension and found that headings alone were more effective in improving comprehension than either outlines alone or headings and outlines together. Dyrud's study on headings concluded that headings "provide text markers for readers and also help keep writers on track"(1996).

Several researchers have found that comprehension improves when the reader is more aware of the author's text structure (McGee, 1982; Meyer, Brandt, & Bluth, 1980; Taylor, 1980, 1985). For example, Meyer, Brandt, and Bluth found that ninth-grade readers who used the text's top-level structure in their subsequent writing about the text recalled more information than those who did not. Thus, many teachers seek to help their students discover the top-level structure of text as a means for improving comprehension and recall. In a study by Barnett (1984), for example, students were taught about

typical text structures used in research reports and journal articles. As a result, their comprehension improved when they read those texts.

Regarding the use of graphics, Gaissmaier, Wegwarth, Skopec, Muller, Broschinski, and Politi (2011) compared information presented in statistical vs. graphic form. All study participants perceived the graphic representation as being more attractive. Regarding information comprehension, however, there was a difference between the study participants who were trained in understanding graphic formats and those who were not. Those with greater graphic literacy scored higher in comprehension and recall with the graphics; those with less graphic literacy scored higher with the raw statistical numbers. Shah, Mayer, and Hegarty (1999) found that the design of visually presented quantitative information has a significant impact on reader comprehension. Poorly designed visuals were less likely to be correctly comprehended, even though they were technically correct, whereas effectively designed visuals were correctly understood. They concluded that the perceptual organization of information in graphs is the single most important factor affecting viewer comprehension. Affirming this conclusion, Butcher (2006) compared comprehension with information presented in three forms: text only, simplified diagrams, and detailed diagrams. She found repeatedly that simplified diagrams were superior in achieving general knowledge and content retention, with no significant difference in learning time. She concluded that the power of visuals comes not from the media itself, but from the careful design of the visual to match natural processes of the human brain.

Regarding the use of direct or indirect approaches in persuasive messages, Brent clarifies the process by which the introduction of an idea affects the reactions to subsequent sentences (1985). Other studies on persuasion focus mainly on other factors, such as the age, gender, or position of the person doing the persuading.

These studies all fall short in investigating how a reader processes messages. For example, a study by Faris and Smeltzer, focusing on the importance of schema in reader understanding, used a 20-question multiple choice survey to assess comprehension (1997). This and other studies test for comprehension but fail to grasp the processing effects of those techniques. This is the gap this study seeks to fill, by providing a research- and reader-based analysis that has heretofore been lacking.

Research Methodology

This project was completed in four stages: (1) document preparation, (2) recruitment, (3) experimentation, and (4) analysis and thesis writing. This section also includes an analysis of the research methodology and its limitations.

Document Preparation

Four sets of paired documents were created:

- Effect of headings: Document A (enhanced) and Document B (unenhanced)
- Effect of agendas[1]: Document C (enhanced) and Document D (unenhanced)
- Effect of approach: Document E (indirect) and Document F (direct)
- Effect of visuals: Document G (enhanced) and Document H (unenhanced)

[1] For a description how agendas are used in this context, see "What are the Effects of an Agenda?"

These final documents covered general business topics in two forms—one with a message-enhancement technique applied, and one without. The specific formats for the enhanced documents were derived from William H. Baker's book *Writing and Speaking for Business*, the textbook used in business communication courses taught in the Marriott School of Management at Brigham Young University. Using verbal protocols, the study participants would then reveal the differences in mental processing between the enhanced and unenhanced versions of each set as subjects read the documents and verbalized their responses. The test documents are included in the appendix to this paper, each pictured alongside its counterpart with highlights to show what changes were made to convert to an unenhanced version.

The topics of the test documents were important. Because the study was based on message-enhancement techniques often used in business writing, business-related topics were ideal. However, these topics couldn't be so familiar that comprehension wouldn't be an issue, as that result would eliminate the possibility of making comparisons about levels of understanding. We also took into account appropriate uses of each message enhancement. Direct and indirect approaches, for example, are typically discussed in a persuasive context; in response, we selected an appropriately controversial topic (establishing a tax on unhealthy foods to curb obesity) for those documents. Because we desired to use a variety of business visuals (charts, tables, and figures), those documents needed to have information complex enough that quantitative visuals would be meaningful. Therefore, the visuals documents discussed global competition due to greenhouse gas-emissions regulations. The unfamiliar topic of special economic zones was paired with headings, which are designed as markers to direct readers through material. Finally, agendas were paired with energy conservation through speed limits. This topic was not technically complex, but did present multiple supporting arguments—a structure that was well matched to the structure established by an agenda.

Recruitment

To carry out our research plan, we first recruited 40 college-age students at Brigham Young University by passing out flyers, sending emails, and offering compensation for participation. To maintain the integrity of the random selection process, no quotas were established for male and female participants or for any particular major, minor, or age category. Our final group reflected a broad range of participants from numerous departments at the university, with a full spectrum of college ages—from 18 through the mid-twenties. Thirty-four of the recruited subjects actually showed up to participate. Additionally, because the documents were designed to analyze techniques taught in the business communication course, only subjects who had not enrolled in or audited that course could participate.

Experimentation

Subjects participated in one of four 1-hour time slots, each with the following timeline:
0-5 minutes:	Researchers distribute consent documents and welcome participants
5-20 minutes:	Researchers train test subjects in proper verbal protocol creation
20-25 minutes:	Researchers distribute documents and escort subjects to rooms
25-50 minutes:	Test subjects read documents and record verbal protocols
50-60 minutes:	Researchers collect consent and test documents; compensate subjects

Training test subjects in proper verbal protocol procedures was extremely important to the integrity of the study. Subjects needed to have sufficient understanding of verbal protocols that they would not simply read the documents aloud, but they could not grasp the purpose of the study (which could bias them towards enhanced documents). The training process consisted of an explanation of what the subjects would be expected to do with the documents. Subjects were told that they should speak aloud into the recorders about their thoughts and impressions while reading the document—to make note of what caught their attention, what they found interesting, and how they reacted. The lecture also emphasized incorrect methods: simply reading the document aloud without interjecting thoughts or skimming over it. Readers were also told to read the document at a regular pace, speak the name of each document aloud to help with transcribing, and to speak aloud about impressions or flashes of insight.

The brief, 60-second lecture was followed by a scripted demonstration by the researchers of the verbal protocol creation process. All participants had received copies of the Informed Consent document that outlined the timeline and expectations. They were asked to follow along as the demonstrator began reading through the document and interjecting comments that reflected how an appropriate verbal protocol would reflect the mental processes of the reader. For example, the demonstrator began by looking over the document, then commenting, "Hmm… read the title… that's an interesting, large title. I wish I knew what in the world verbal protocol analysis was. Oh look, the introduction, maybe this will explain a little bit more." This process gave readers an example of how to represent their own thoughts without being overpowered by the content of the document.

Analysis and Thesis Writing

The most time-consuming portion of the analysis process was transcribing the recordings to make electronic copies for further analysis. Because each of the 34 test subjects submitted a verbal protocol for each pair of documents, the final transcriptions were extensive: over 130 pages of text and 72,000 words. After the transcriptions were completed, we quantitatively and qualitatively analyzed the participants' reactions to all document pairs, noting comprehension, confusion, interest in the topic, the effects of each message-enhancement technique, and other general reading trends.

The rigorous qualitative analysis took three stages. First, the verbal protocols from each reader were analyzed. This preliminary review checked for basic trends, using a color-coded highlighting system across the documents. For example, yellow was used to highlight instances where the readers simply noticed an enhancement: "Look, there's a heading," or "Oooh, this one has pictures!" If the reader added an evaluation of the enhancement ("I like pictures," or "Those numbers are really helpful," for example), it was highlighted in green. Blue was used for any expressions of confusion or questions; if the reader resolved their confusion or answered their question later in the document, that instance was marked with light blue. Pink marked predictions or any overall evaluations about the document, such as, "This is really well organized," or "I like this document." The comment feature noted other unique events, such as a reader jumping down the page.

The second stage analyzed by document, not reader. All Document A transcriptions, for example, were compiled into a single document, separating them from Document C or other forms. Here the highlighted sections were reviewed for accuracy and refined for consistency within the document form. Additionally, we wrote summaries for each reader's transcription of that document, noting any recurring events, the reader's overall response, and how it related to the trends emerging from other readers.

Third, the document sets were compared to their counterparts (Documents A vs. B, C vs. D, E vs. F, and G vs. H). This process looked at key points in the documents and how readers responded in the enhanced and unenhanced versions. When the idea of taxation was introduced in Document E and Document F, how did the readers respond? Or, after reading a particular sentence about greenhouse gas emissions, did Document G readers respond differently than Document H readers? Or, at the point where a heading existed in Document A, what was the generic state of mind of Document B readers? Often, the results showed that responses were consistently different between the enhanced and unenhanced forms.

We performed quantitative analyses by comparing lengths of verbal protocols, instances of indicative phrases, and other quantifiable factors as shown in the following four major sections, relating to (a) headings, (b) agendas, (c) approach, and (d) visuals.

Research Methodology Analysis

This research methodology has three primary limitations: (1) the sample group of test subjects, (2) the verbal protocol analysis process, and (3) the test documents. Despite these limitations, the resulting data is nevertheless very informative on the effects of enhanced text.

First, the sample size consists of only students, though from a broad range of ages and backgrounds. Decades of prior research has debated the use of college students as a representative sample of adults as a whole, with empirical examples from almost every area of business-related research, from accounting and human resources to information systems (Fuchs & Sarstedt, 2010; Ok, Shanklin, & Back, 2008; Walters-York & Curatola, 2000). Claims of excessive homogeneity within a student sample attempt to weaken generalizations connecting results from college student groups to the general adult population (Peterson, 2001). However, this project overcomes these barriers in two ways: first, by emphasizing that this study is not based on age-specific factors such as consumer preferences, but on skills and processing techniques that are identifiable in all age groups. Second, by recognizing that the homogeneity found in a college-age sample is just as representative as any other sample group. This sample actually supports the claims by improving the capabilities of comparing between sample groups.

Second, the documents were analyzed only through verbal protocols, which carry the limitations of that form of research. An early analysis by Ericsson and Simon (1993) described verbal protocols in two forms: retrospective or concurrent. Flower and Hayes (1981) added subcategories of think-aloud and directed reports. Each form carries its own advantages and limitations. This study required subjects to use concurrent verbalization of all thoughts, meeting the criteria for a think-aloud verbal protocol. These and other Smagorinsky's review on the effectiveness of verbal protocol analysis agrees that information collected in this manner is most effective for reaching conclusions about how the verbal responses were produced—in this study, the mental processing of the readers (1989). An advantage of this form is that the data does not suffer losses of accuracy due to a time delay between the process and the verbalization. Other arguments against verbal protocols involve the method in which the readers are instructed and recorded. In this study, readers were instructed to verbalize their thoughts, but not required to explain the thought process that brought them to the conclusion. According to Ericsson and Simon (1993), "Such utterance will cause the subject to take more time with the task, but will not change the structure of the process." Many studies agree claim that speaking aloud does not affect the

cognitive processes of a task (Weisberg & Fleck, 2004; Tversky, 1969). Therefore, the verbal protocols resulting from this study contain valuable information about the mental processes of the reader.

 Third, the data is limited to the message enhancements as prepared in the test documents. Though alternative forms of each enhancement type do exist, to establish effective controls on the project only basic forms were used in these documents. A more complete review of these documents and thoughts for future studies are included below under "Recommendations."

What are the Effects of Headings?

The headings test documents discussed the history, locations, and controversy associated with Special Economic Zones. Document A included headings describing each of these sections and Document B did not—each paragraph contained the same sentences and subjects, and the paragraphs were simply spaced apart without a descriptive label. Both Document A and Document B are included in the appendix. Comparing verbal protocols of the two forms revealed that headings have a noticeable impact on reader processing. Headings both increase reader understanding and elicit positive responses when compared to the document without headings.

Headings Increase Reader Understanding

In general, readers of Document A (with headings) understood the concepts better than readers of Document B (without headings). The verbal protocols from the two sets of readers show that headings increase reader understanding by eliminating content-related questions, minimizing confusion, and encouraging the use of processing techniques to boost understanding.

Use of Questions. Document B readers asked over five questions per reader, on average. Document A readers asked about half as many questions, averaging only 2.75 questions per reader. Although this data alone demonstrates the difference in understanding between the two groups of readers, the nature of the questions gives additional insight. Most questions asked by Document A readers were peripheral—they asked questions relating to, but not covered in the document, such as, "I wonder why critics don't think they can sustain such a large number. Maybe their infrastructure?" Content-related questions were answered quickly because of headings' ability to pre-emptively settle reader concerns (see *Encouraging Processing Techniques* below). Questions asked by Document B readers were focused on comprehension, causing them to repeat questions when they failed to recognize answers or comprehend primary concepts.

Minimizing Confusion. Differences in confusion levels are the primary indication that Document B readers did not understand the concepts as well as Document A. Again, the data speaks strongly in favor of headings. Though multiple Document B readers bluntly stated that they were "confused," confusion was never mentioned by any Document A readers. On average, each Document B reader made 2.75 comments that they didn't "get it," "know," or "understand." For Document A readers, the average was 1.75 of the same comments—80 percent of which occurred in the first five sentences (see Table 1). The same cannot be said of Document B comments, which were spread throughout the document as pervasively as the confusion experienced by its readers.

Table 1. Data Comparison and Percent Changes for Headings Documents					
Number of…	Document A: Headings		Document B: No Headings		Avg. % Change (From A to B)
	Count	Avg. per Reader	Count	Avg. per Reader	
Confusion Phrases	21	1.75	44	3.14	+ 80%
Questions	33	2.75	72	5.14	+ 87%

Table 1 Compares number of confusion phrases, questions, and words for Document A and Document B. Demonstrates that Document B resulted in increased confusion and number of questions.

Encouraging Processing Techniques. Headings eliminate confusion by enabling processing techniques to help readers better understand the concepts. Document A readers used headings as reference points, to pre-emptively answer questions, and to assess content in future sections. Document B readers were denied these processing techniques, leading to a lower level of understanding.

Headings Elicit Positive Responses

Undoubtedly, the increased understanding achieved by headings contributed to the nature of the reader reactions to Document A. Final reader responses for Document A were generally much more positive than the final responses for Document B, which was dominated by frustration, dislike, apathy, and boredom. While Document A readers commented on the document's organization and clarity, Document B readers said that "It doesn't really explain it at all…. It's kind of frustrating." The majority of Document A readers found the article interesting; the majority of Document B readers found the document confusing and frustrating. A typical Document A reader would finish reading the document by saying, "That was an interesting article," while Document B readers concluded, "I don't like this document. I feel kind of dumb reading it." Combining the previous factors that showed how headings improve understanding explains the difference: readers react more positively to documents that they better understand. Therefore, readers found Document A more interesting and worthwhile than Document B. Clearly, headings have a significant positive impact on reader processing and responses.

What are the Effects of an Agenda?

The two agenda test documents, Document C and Document D, argued that lowering the national speed limit to 55 mph would conserve energy. Document C included the agenda, using an opening, agenda, body, conclusion (OABC) structure; Document D had none of the agenda indicators and was identical except for the enhanced sections where the agenda was inserted. In this context, an agenda refers to a statement (typically at the end of the first paragraph) that delineates the topics to be discussed. This enhancement technique is a sentence-length, concise version of the agendas often used to organize meetings, with the same intention of providing organization within a document. Following this introductory sentence, a proper agenda structure will later reference the initial agenda by using the same indicators. The document should conclude with a repetition of the agenda arguments.

In Document C, the agenda is as follows: "To conserve energy, a nationwide speed limit of 55 miles per hour (mph) would be beneficial for three reasons: (1) a prior record of success, (2) an ability to encourage speeds with optimal fuel efficiency, and (3) a power to offset decreases in fuel efficiency from increased weight and accessories." Later paragraphs began with a brief reference to the agenda:

"First, a nationwide speed limit is a viable option because of the historic 1974 attempt that showed promising results." The concluding paragraph also referred back to the agenda: The speed limit is an attractive proposition because of three advantages: (1)…." The unenhanced version in Document D simply read, "To conserve energy, a nationwide speed limit of 55 miles per hour (mph) would be beneficial," intentionally neglecting to outline the forthcoming arguments. Subsequent paragraphs did not use agenda indicators, nor did the conclusion repeat the main arguments.

Verbal protocol analysis revealed that an agenda adds clarity and organization by helping readers predict, order, and reflect on arguments, while without an agenda, readers moved quickly through a document with minimal reflection or outside comments.

Agendas Add Clarity and Organization

Readers with an agenda gain clarity and perceive organization because they are more likely to predict what a document or paragraph will contain, to order the concepts according to the agenda, and then to reflect on them in the conclusion. All of these techniques help readers connect individual concepts to the overall argument and were demonstrated by Document C readers.

Predict Document Content. Almost all Document C readers used the initial agenda to predict what the document would discuss. The agenda acted like a thesis statement by presenting the main points in the beginning of the document, a familiar format helped readers understand the agenda's purpose: "So these points are the three points that are going to be discussed in this essay." Readers understood that the agenda outlined the arguments that the article would cover, as shown by the following comment: "…a prior record of success—they'll probably talk about that later."

Order Concepts. Reader comments also demonstrated that the agenda helped organize the arguments by presenting the format of the article in a single sentence. Subsequently, readers better understood the order in which the arguments were given, as the document reflected the agenda order. Stating that, "So, the first should be a prior record of success," shows that this reader understood that the first agenda item would relate to the first argument paragraph. Another reader used the same process to identify the subject of the third argument paragraph: "Third is going to be the third one…offset the decreases in fuel efficiency caused by increased weight and accessories." Readers who used the agenda as a reference understood each paragraph's argument quickly as well as each paragraph's connection back to the main argument.

Reflect on Previous Arguments. The influence of the agenda was especially obvious in the conclusion as readers not only read through the final statements, but also used the agenda points to reflect on the respective arguments made in previous paragraphs. This reflection caused this reader to review the first argument while reading the conclusion: "I am one to go for historically proven success. But I'm not one to go for historically proven success if research shows that there could be greater success in another area." Some readers' reflections covered multiple main arguments as they read through each portion of the agenda, as with the following example: "…three advantages: (1) using a system with historically proven success—yeah, when people couldn't go fast anyway; (2) increasing national fuel efficiency—won't work…." Many of these reflections repeat comments that readers had made about those arguments while reading Document C, either positive or negative.

No Agenda Causes Minimal Reflection and Outside Comments

Agenda-based conclusions help readers connect individual concepts to the overall argument. However, none were used by any Document D readers, illustrating that this connection process is due to the presence of an agenda. While a basic conclusion may cause readers to reflect on their feelings about the entire document, an agenda-based conclusion causes them to reflect on the individual arguments that make up their feelings about the entire document. For example, multiple Document C readers commented on the document's organization and structure and often reflected on each argument as they read it in the conclusion; Document D readers instead commented exclusively on the content.

The more comprehensive review given by Document C readers was also shown by the comparative lengths of the concluding comments. Measuring concluding comments (meaning any comments that were differentiated from the actual text of the document) illustrates these comparatives lengths: the median for Document C readers was 46.5 words within the concluding paragraph, an 86 percent increase from the Document D readers with a median of 25 words. (See Figure 1 for a graph showing the respective measurements of concluding comments.) This large difference is due to the large amount of reflective comments by Document C readers, a direct result of the agenda's concluding influence.

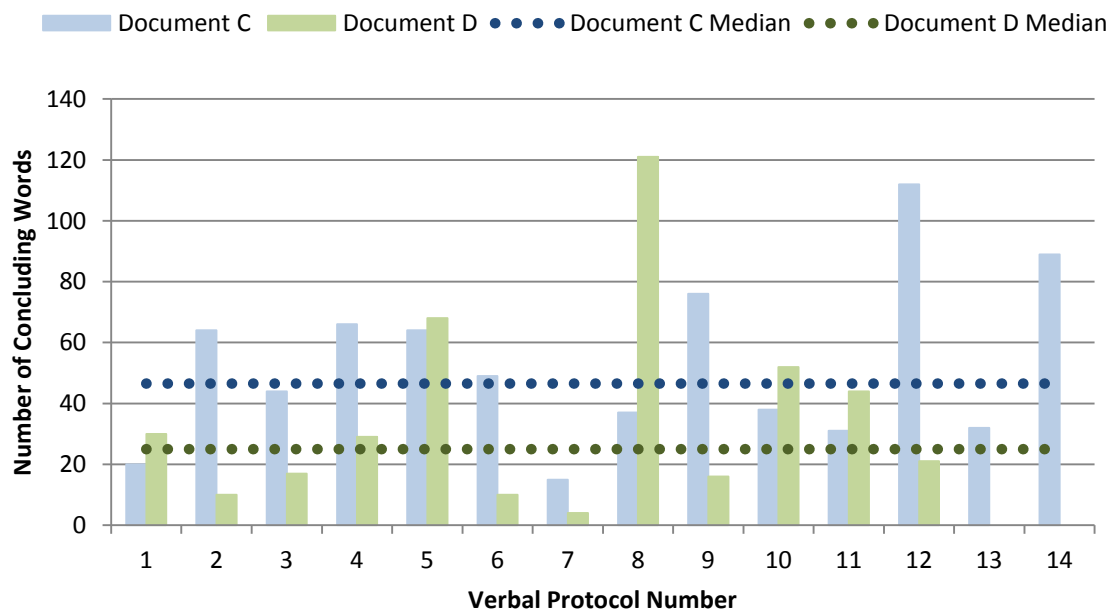**Figure 1. Number of Concluding Words in Documents C and D**

Figure 1 Shows the number of concluding comments for Document C and Document D. The large difference in the medians between Document C (46.5 words) and Document D (25 words) suggests that an agenda causes readers to reflect more on the document at the conclusion.

What are the Effects of Different Approaches?

The two approach documents were designated as Document E and Document F. Document E used an indirect approach, while Document F applied a direct approach. The differences in reader responses for Documents E and F show that different approaches clearly impact reader processing. This conclusion is evident because, besides one paragraph that moved from the end to the beginning of the document, the content for the two documents was entirely undifferentiated text, yet reader processing was very different. Our comparison of responses showed that for controversial issues, an indirect approach is more persuasive than a direct approach.

Indirect Approach is Persuasive

After reading, "The *British Medical Journal* found that a 'fat tax' could prevent up to 1,000 premature deaths from heart disease annually," a Document E reader commented, "Wow. This is really persuasive." This same reader had earlier expressed neutrality towards the idea of a 'fat tax.' No Document F readers made similar approving comments, leaving behind the task of identifying what factors caused the difference in persuasiveness. Both Document E and Document F were reviewed by readers who opposed the idea of taxation when it was introduced. However, the difference in the persuasiveness of the approach became apparent after tallying the number of initially antagonistic readers who, by the end of the document, were convinced otherwise: for Document E, six of six; for Document F, zero of seven. All seven Document F (direct approach) readers who were initially antagonistic to a 'fat tax' maintained that position during the conclusion, yet the six antagonistic Document E (indirect approach) readers were convinced to either neutrality or approval.

This transition away from a negative attitude was not shown only by readers who were very antagonistic to the idea of a tax. Some Document E readers were neither antagonistic nor supportive of the idea originally. However, each finished the document either in favor of the idea or, at least, not opposed to it. With an indirect approach, readers tended to "move up" a category of approval by the end—those without a strong opinion initially were in favor by the end, and those antagonistic in the beginning were no longer opposed by the end. Table 2 shows this transition between levels of approval between the beginning and the end.

Table 2. Document E Readers at Different Approval Levels		
Level of Approval	**Middle of Document**	**End of Document**
Approval (highest)	4	8
Neutral (middle)	3	5
Opposed (lowest)	6	0

Table 2. Tracks the number of readers at different levels of approval for different points in Document E. The results show that although six readers opposed the document when taxation was introduced, none remained opposed by the end. Significantly, although only four approved taxation by the middle, eight expressed approval by the end.

A clear contributor to persuasion is the level of antagonism carried throughout the document. This factor favors an indirect approach, where the point of conflict (the argument that the United States government *should* instate a 'fat tax') is not presented until the end of the last paragraph, and even the idea of taxation doesn't appear until the third paragraph. Discussing taxation logically before putting it in context of a call to action minimized overall antagonism, and prevented disapproval from developing at the beginning of Document E.

Direct Approach Strengthens Original Positions

By its nature, Document F's direct approach entailed putting the call to action at the beginning, thereby giving readers a source of antagonism before the rationale had been fully explained. As shown by the lack of persuaded readers with Document F, this technique made it unlikely for readers to overcome that initial barrier. By the end of the document, the difference was clear: no readers with the direct approach were persuaded away from their original opinion. Once a reader expressed disapproval for a concept, that disapproval seemed insurmountable within the context of the document. This characteristic of Document F responses helps clarify the nature of the direct approach and infer potential uses: because initial antagonism is unlikely to dissipate with a direct approach, this method would be more effective under noncontroversial situations where antagonism is unlikely to arise. If controversy (as with the "fat tax" presented in Document E and Document F), then an indirect approach is more likely to be effective in persuading a reader to agree with the document's argument by avoiding the initial antagonism.

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What are the Effects of Visuals?

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The two visuals test documents, Document G and Document H, were entitled *Greenhouse Gas Emissions* and discussed the negative impact of greenhouse-gas-emissions regulations on global competitiveness and legislation intended to mitigate these effects. As the most technical subject of the four sets of documents covered in this study, the documents covering greenhouse gas emissions were suitable to study the effects of visuals. Document G contained three visuals explaining the more technical concepts, while Document H had no visuals, requiring readers to comprehend based on textual analysis alone. The clear difference in reader responses for Document G and Document H showed that visuals have a huge effect on reader processing. Besides helping readers to process information, visuals also have the effect of improving reader understanding and increasing the length of reader focus on the topic.

Visuals Improve Reader Understanding

Although the visuals in Document G initially elicited confused comments by readers, the overall results showed that the visuals were invaluable tools for improving understanding. In Document G, the confusion originally expressed had typically dissipated by the middle of the document, due to text that accompanied each figure. In Document H, the confusion was pervasive throughout all subsequent paragraphs. Because the only difference between the two was the presence of visuals, clearly the visuals were the determining factor between comprehension and confusion. Though the text following the visual helped Document G readers understand, especially after a particularly confusing figure, text alone was insufficient (without the support of the visuals) to have the same effect on Document H readers.

Visuals Increase Length of Focus on Topic

Along with higher comprehension, Document G readers also produced more comprehensive verbal protocols. These longer responses appropriately reflected the more thorough understanding gained by Document G readers. The median protocol length for Document G readers was 948 words; for Document H protocols, the median was only 648, a 31 percent difference in protocol length (see Figure 2). Additionally, Document G readers demonstrated that more attention was paid to topics with accompanying visuals. A Document H reader, for example, commented, "Trade intensity, or the ratio of the sum of the imports and exports to the sum of the shipments and imports, must be 15 percent or greater. More economic stuff, I guess…." Although this reader was content to let the information pass without further understanding, all Document G readers saw the visual as a signal that the information was too important to overlook—resulting in many comments in a section that otherwise may have been ignored. Readers with accompanying visuals tended to worry much more about understanding a confusing portion, while readers without visuals simply skipped over it.

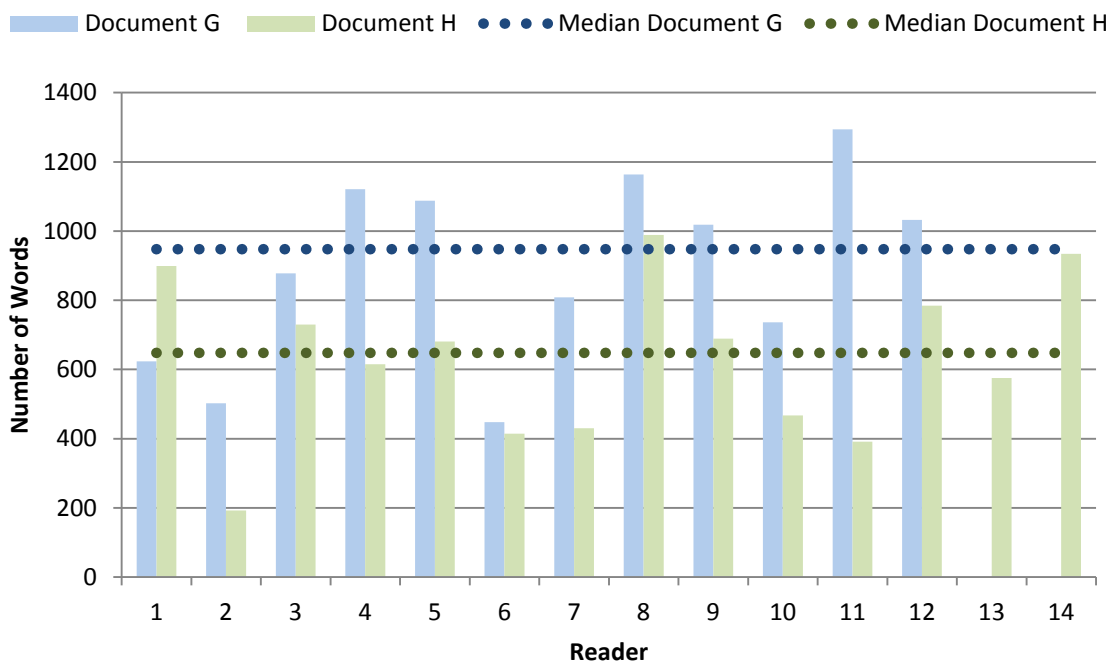**Figure 2. Total Protocol Length and Medians for Document G and H**

Figure 2 Compares protocol lengths and medians for Document G and Document H. The gap between the medians (948 for Document G compared to 648 for Document H) shows that the inclusion of visuals results in longer protocols, indicating that visuals results in further reflect and analysis.

Summary

Using verbal protocol analysis, this study has analyzed the effects on reader processing of four message-enhancement techniques: headings, agendas, approach, and visuals. By controlling for the message

enhancements, the experimental design allowed conclusions to be drawn from the comparisons between sets of reader responses. Although each message-enhancement technique proved valuable to readers in some regard, the results for each were very different from each other. This research study helps provide support for the following conclusions.

Headings
- Readers respond positively to headings, praising the contribution to organization and structure.
- Within the document, readers use headings as reference points, to preemptively answer questions, and to assess upcoming content.
- Headings help readers understand the document clearly, resulting in a straightforward "read through" with all questions being resolved within the paragraph where the question is raised. Without headings, readers are often confused and unable to identify the answers to questions.
- Readers with headings find the document interesting, while readers without headings find the same material confusing and frustrating.

Agenda
- Readers appreciate that an agenda outlines arguments initially and adds to the clarity of the organization by repeating points in the conclusion.
- Within the document, readers use an agenda in three ways to process information: (1) to predict what will be discussed, (2) to put concepts in order, and (3) to reflect on previous arguments while reading the summarizing points.
- An agenda results in an increase in concluding thoughts and reflection, a step that does not appear without an agenda.

Approach
- An indirect approach is more persuasive with a controversial issue, because it prevents antagonism to a controversial idea until the supporting arguments have already been presented.
- With an indirect approach, readers are likely to move to higher levels of approval throughout the document. With a direct approach, readers rarely shift from their initial reaction.
- Early antagonism makes readers less likely to be convinced by supporting arguments.

Visuals
- Readers use visuals to improve processing in three ways: (1) to focus attention on important data, (2) to explain concepts being discussed, and (3) to get an overall view of the document.
- Visuals result in better overall understanding. Though readers may not understand the concepts until reading the accompanying text, text alone is insufficient for understanding.
- Without visuals, readers tend to skip past confusing portions instead of working to understand them, resulting in shorter document reviews and inconsistent reader responses.

Implications

The above findings provide strong evidence that message enhancements such as headings, agendas, approach, and visuals can greatly affect reader processing of written documents. These results also concur with the use of enhancement techniques as researched by other studies. Brooks, Dansereau, Surplin, and Holly (1983) claimed that headings improve comprehension; verbal protocol analysis adds insight into the exact processing techniques (using headings as reference points, to preemptively answer questions, and to assess upcoming content) that lead readers to increased understanding. Shah, Mayer

and Hegarty (1999) determined that the design of visually presented information is critical to comprehension, while Gaissmaier, Wegwarth, Skopec, Muller, Broschinski, and Politi (2011) added that graphic literacy affects readers' abilities to understand complex graphics. Both claims were present in this study, where readers demonstrated that despite visual processing techniques, the visuals themselves may add confusion if misunderstood. This research takes the critical next step in explaining *why* and *how* message enhancement techniques affect understanding.

Understanding document processing from the reader's perspective is a critical portion of effective written communications. Thus, writers who effectively utilize these message enhancements will be better able to write with headings to improve clarity, use agendas to increase reader reflections, apply an indirect approach to boost persuasiveness, and include visuals to improve understanding of complex topics.   These tactics are applicable across a wide variety of writing situations in all areas of business and government. Further, the use of agendas, the indirect order, and visuals seems also applicable in giving oral business presentations, although additional research might be needed to confirm consistency between written and oral message tactics.

The results of this study also have great implications for teachers of business writing. Although much of the instruction in business writing courses will focus on the actual process of composition, such teaching should be augmented with instruction on how to effectively use headings, agenda, different approaches, and visuals. These four writing enhancements can be fairly quickly learned and easily applied to achieve significant improvement in the effectiveness of business messages.

Recommendations

This study focused on reader processing and general trends for each enhancement form; however, much of the data merely raised questions for future research. The next step in this investigation into message enhancement techniques is to analyze the utility-specific issues for each message enhancement technique. We propose the following recommendations for future studies:

Headings. These documents did not analyze the effectiveness of different hierarchies of headings. Additionally, the results hinted at (but did not include enough data for a firm conclusion) what types of headings are the most effective. For example, the number of comments about headings significantly decreased as readers progressed through Document A. Future research will be needed to determine if the change was due to differences in the headings themselves (length, format, interest appeal to readers) or to a typical progression through the document. Analyzing those additional areas would require new documents that instead controlled for the type of heading: hierarchy, phrase structure, or location.

Agendas. This study showed that an agenda does result in improved organization and provided insights into how readers use an agenda. However, it did not demonstrate increases in understanding or improve overall reader responses—an unexpected response, considering its widespread use in business communications standards. The data is not definitive enough to determine if the lack of a difference was because the document was too simplistic or because an agenda does not increase understanding.   Because the purpose of an agenda is to outline, clarify, and explain, the basic 1-page document used in this study may not have been complex enough to show a significant difference in understanding. Perhaps with a longer or more complex document, the full potential of an agenda could be better analyzed. Alternatively, the

agenda itself could have been simplified to show a more realistic use of an agenda for shorter versions of business documents; in memos, letters, or other short written communications, the most effective agendas do not include the entirety of the Opening – Agenda – Body – Conclusion (OABC) structure.

Approach. Though the scope of this study was sufficient for the claims made about the effect of approach, the point of comparison between the two documents was limited to only a portion of reader responses—those who had a negative view of the 'fat tax,' the controversial issue that was presented. To make this study more effective, a more controversial issue could have been chosen that would have afforded a larger point of comparison. The unrealistic ideal is a topic where all readers are initially repelled by the idea; then the comparison of whether or not they were able to be persuaded could be effectively attributed to the structural differences.

Visuals. Though this study undeniably gave insights into some of the effects of visuals, visuals remain perhaps the most complex of the message enhancements with innumerable possibilities for future research. For example, Figure 3 in Document G received the fewest number of reader comments. Only further research can determine if that difference is due to its location on the page (at the end of the text) or to something within the visual itself. Other visual-related issues include color, size/position, complexity, numbers vs. images, page/image ratio, etc. Future studies could also analyze which visual forms (pictures, tables, graphs, or charts) are the most complex for readers, and whether or not complexity affects how readers process information.

Continuing to investigate business message enhancements will continue to add to existing knowledge on how to improve efficiency, clarity, and effectiveness in business writing.

References

Baker, W. H. (2001). HATS: A design procedure for routine business documents. *Business Communication Quarterly*, *64*(2), 65–76. doi: 10.1177/10805699010640020

Baker, W. H. (2007). *Writing and speaking for business*. Provo, UT: BYU Academic Publishing.

Barnett, J. E. (1984). Facilitating retention through instruction about text structure. *Journal of Reading Behavior*, *16*(1), 1–13.

Brent, D. (1985). Indirect structure and reader response. *Journal of Business Communication, 22*(2), 5–8. Retrieved from Business Source Premier.

Brooks, L. W., Dansereau, D. F., Spurlin, J. E., & Holley, C. D. (1983). Effects of headings on text processing. *Journal of Educational Psychology*, *75*(2), 292–302.

Butcher, K. R. (2006). Learning from text with diagrams: Promoting mental model development and inference generation. *Journal of Educational Psychology*, *98*(1), 182–197.

Douglas, Y. (2008). *How plain language fails to improve organizational communication.* doi: 10.1.1.94.6950

Dyrud, M. (1996). Teaching by example: Suggestions for assignment design. *Business Communication Quarterly, 59*(3), 64–65. Retrieved from Business Source Premier.

Ericsson, K. A. (2002). Protocol analysis and verbal reports on thinking: An updated and extracted version from Ericsson. *Applied Cognitive Psychology, 16.* Retrieved from http://www.psy.fsu.edu/faculty/ericsson/ericsson.proto.thnk.html

Ericsson, K. A., & Simon H. A. (1993). *Protocol analysis: Verbal reports as data (revised edition).* Cambridge, MA: Bradford Books, MIT Press.

Faris, K. A., & Smeltzer, L. R. (1997). Schema theory compared to text-centered theory as an explanation for the readers' understanding of a business message. *Journal of Business Communication*, *34*(1), 7–26. Retrieved from Business Source Premier.

Flower, L., & Hayes, J. R. (1981). A cognitive process theory of writing. *College Composition and Communication, 32*(4), 365–387. Retrieved from http://www.jstor.org/stable/356600

Fuchs, S., & Sarstedt, M. (2010). Is there tacit acceptance of student samples in marketing and management research? *International Journal of Data Analysis Techniques and Strategies*, *2*(1), 62–72. doi: 10.1504/IJDATS.2010.030011

Gaissmaier, W., Wegwarth, O., Skopec, D., Muller, A., Broschinski, S., & Politi, M. C. (2011, August 15). Numbers can be worth a thousand pictures: Individual differences in understanding graphical and numerical representations of health-related information. *Health Psychology,* Advance online publication. doi: 10.1037/a0024850.

Hartley, J., & Trueman, M. (1985). A research strategy for text designers: The role of headings. *Journal of Instructional Science, 14*(2), 99–155. doi: 10.1007/BF00052394.

McCabe, P. P., Kraemer, L. A., Miller, P. M, Parmar, R. S., & Ruscica, M. B. (2006). The effect of text format upon underachieving first year college students' self-efficacy for reading and subsequent reading comprehension. *Journal of College Reading and Learning*, *37*(1), 19–42.

McGee, L. M. (1982). Awareness of text structure: Effects on children's recall of expository text. *Reading Research Quarterly*, *17*(4), 581–590.

Meyer, B. J. F., Brandt, D. M., & Bluth, G. J. (1980). Use of top-level structure in text: Key for reading comprehension of ninth-grade students. *Reading Research Quarterly*, *16*(1), 72–103.

Ok, C., Shanklin, C. W., & Back, K. (2008). Generalizing survey results from student samples: Implications from service recovery research. *Journal of Quality Assurance in Hospitality and Tourism*, *8*(4), 1–23. Retrieved from http://hdl.handle.net/2097/942

Pressley, M., & Afflerbach, P. (1995). *Verbal protocols of reading: The nature of constructively responsive reading.* Hillsdale, NJ, England: Lawrence Erlbaum Associates, Inc.

Shah, P., Mayer, R. E., & Hegarty, M. (1999). Graphs as aids to knowledge construction: Signaling techniques for guiding the process of graph comprehension. *Journal of Educational Psychology, 91*(4), 690–702.

Sharp, H. M. (1993). Structure student success in indirect writing. *Bulletin of the Association for Business Communication*, *56*(4), 49–50. Retrieved from Ebsco Host.

Smagorinsky, P. (1989). The reliability and validity of protocol analysis. *Written Communication, 6*(4), 463–478. doi: 10.1177/0741088389006004003

Spyridakis, J. H., & Standal, T. C. (1987) Signals in expository prose: Effects on reading comprehension. *Reading Research Quarterly*, *22*(3), 285–298.

Taylor, B. M. (1980). Children's memory for expository text after reading. *Reading Research* Quarterly, *15*(3), 399–411.

Taylor, B. M. (1985). Toward an understanding of factors contributing to children's difficulty summarizing textbook material. In J. A. Niles (Ed.), *Issues in literacy: A research perspective. Thirty-fourth yearbook of the National Reading Conference* (pp. 125–131). Rochester, NY: National Reading Conference.

Vaiana, M. E., & McGlynn, E. A. (2002). What cognitive science tells us about the design of reports for consumers. *Medical Care Research and Review*, *59*(3), 3–35. doi: 10.1177/10775587020590010

Walters-York, M., & Curatola, A. P. (2000). Theoretical reflections on the use of students as surrogate subjects in behavioral experimentation. In (Ed.), *Advances in Accounting Behavioral Research, Volume 3* (pp. 243–263). Emerald Group Publishing Limited. doi: 10.1016/S1474-7979(00)03034-9.

Weisberg, R. W., & Fleck, J. I. (2004). The use of verbal protocols as data: An analysis of insight in the candle problem. *Memory & Cognition, 32*(6), 990–1006. doi: 10.3758/BF03196876.

Tversky, A. (1969). Intransivity of preferences. *Psychological Review*, 76(1), 31–48. doi: 10.1037/h0026750.

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Document A

Special Economic Zones

As the concept of a global economy spreads, developing countries struggle to remain competitive with more established economies. To overcome this obstacle, many developing countries established Special Economic Zones (SEZs) to solicit foreign investment, increase exports, and provide employment—often in an economy unable to support its own industrial growth. By 1997, 93 countries had established SEZs, employing over 22.5 million people. These numbers had increased to 116 countries and 3000 SEZs by 2003, employing 43 million people.

~~What are Special Economic Zones?~~

Special Economic Zone (SEZ) is a general term for established geographic regions with different economic and trade requirements from the rest of the country. Many SEZs are also identified by a more specific zone type, such as Free Trade Zones (FTZs), Export Processing Zones (EPZs), and Ecozones. The more liberal economic and trade laws in SEZs are established to attract foreign investment in that area, usually by eliminating tariffs, providing tax incentives, etc.

~~SEZs Around the World~~

Of the SEZs found in Brazil, China, the Philippines, Iran, Poland, Russia, Cambodia, and other countries, most follow the model established by the People's Republic of China. China established some of the earliest SEZs in the 1980s. The most successful of these, Shen grew from a small village to a city of 10 million in 20 years. SEZ success in China has been so great that the government declared the entire Hainan province to be an SEZ, a huge departure from the traditional city model. India took the program a step further with its Special Economic Zone Act of 2005. By 2006, over 500 SEZs had been proposed and over 220 created—all to the surprise of critics who doubt the nation's capacity to sustain such a large number.

~~Controversy~~

Despite the successes, SEZs policies continue to cause global controversy. Local companies oppose SEZs for the license they grant foreign investors to bypass normal regulations. Examples include situations where domestic governments pay portions of factory setup, loosen environmental and employee protection laws, and limit taxation for foreign businesses. To a degree, a government's willingness to make allowances for foreign investment determines the success of an SEZ, leading to "bidding wars" between developing nations as they solicit foreign businesses at the expense of local economic growth.

~~Conclusion~~

As the growth of SEZs has only begun to explode in the last decade, the future of these zones remains uncertain. However, examples of experimentation with the traditional model (such as India and China) and examples of extreme success show that SEZs will be a part of the global economy for years to come, despite criticism from various venues.

Document B

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Figure 3 Shows the steps taken to change Document A (left) into Document B (right). Removing the highlighted portions of Document A resulted in the Document B version, with no headings.

Document C — Lowering the Nationwide Speed Limit

On May 3, 2010, unleaded gasoline prices reached a nationwide average of $2.898 per gallon, according to the American Automobile Association—a higher rate than any point in 2009. The Energy Administration Association, CNN Money, and other financial and energy experts around the country expect these prices to continue increasing throughout the year. These high prices, though not near the peak national average of $4.11 from July 2008, have refocused attention on energy conservation. To conserve energy, a nationwide speed limit of 55 miles per hour (mph) would be beneficial ~~for three reasons: (1) a prior record of success, (2) an ability to encourage speeds with optimal fuel-efficiency, and (3) a power to offset decreases in fuel efficiency from increased weight and accessories~~.

~~First,~~ a nationwide speed limit is a viable option because of the historic 1974 attempt that showed promising results. The Arab oil embargo of 1973 brought fuel conservation to the forefront of national issues. As a result, Congress approved a national speed limit of 55 mph and restricted federal funding on highway projects in states with maximum speed limits above that level. The law was relaxed to allow a 65 mph maximum in rural interstates in 1987, and repealed entirely in 1995. The estimated impact of that law was a fuel savings ranging from 0.2 to 3.0 percent of annual gasoline consumption. This feat could be replicable today; in 2008, the Department of Energy (DOE) estimated that reinstating the 55 mph speed limit could conserve 175,000 to 275,000 barrels of oil per day (0.8 to 1.3 percent of U.S. daily consumption of petroleum for 2007) by requiring car owners to drive at fuel-efficient speeds.

~~Second,~~ a lower speed limit would require car owners to drive at speeds with optimal fuel efficiency. Once a vehicle reaches approximately 35 to 45 mph, a 5 mph reduction in speed can increase fuel economy by 5 to 10 percent due to an exponential decrease in air resistance as a vehicle slows down. While the range of optimal fuel efficiency varies greatly between vehicles, all of the 13 vehicles tested by the Federal Highway Administration (FHWA) and the DOE demonstrated optimal fuel economy at speeds below 55 mph.

~~Third,~~ instating a new limit would offset the decreases in fuel efficiency caused by increased weight and accessories in newly released cars. Despite automotive technology advances in the last two decades, fuel economy has not significantly improved to due increases in vehicle weight and accessories. According to the Environmental Protection Agency (EPA), average vehicle weight increased from 3,220 pounds in 1987 to 4,117 in 2008. From 1987 to 2004, most technological innovations were directed towards market-driven attributes (i.e. performance, engine size, and accessories) that contribute to loss of fuel efficiency.

Establishing a national speed limit of 55 mph is a viable option for alleviating the pressures of global increases in gas prices. The speed limit is an attractive proposition ~~because of three advantages: (1) using a system with historically proven success, (2) increasing national fuel efficiency, and (3) offsetting decreases in fuel efficiency caused by increased weight and accessories. This solution~~ should not be dismissed out of hand.

Document D — Lowering the Nationwide Speed Limit

On May 3, 2010, unleaded gasoline prices reached a nationwide average of $2.898 per gallon, according to the American Automobile Association—a higher rate than any point in 2009. The Energy Administration Association, CNN Money, and other financial and energy experts around the country expect these prices to continue increasing throughout the year. These high prices, though not near the peak national average of $4.11 from July 2008, have refocused attention on energy conservation. To solve the problem, a nationwide speed limit of 55 miles per hour (mph) would be beneficial.

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Establishing a national speed limit of 55 mph is a viable option for alleviating the pressures of global increases in gas prices. The speed limit is an attractive proposition that should not be dismissed out of hand.

Figure 4 Shows the steps taken to change Document C (left) into Document D (right). Removing the highlighted portions of Document C resulted in the Document D version, with no agenda.

Document F

Economics and Obesity

Obesity in the United States is a national health crisis, costing the population billions in additional healthcare and harming overall life expectancy. As previous efforts have been ineffective, more drastic action must be taken. Therefore, the United States government should instate a tax on junk foods (a "fat tax") to simultaneously curb unhealthy consumption and provide revenue to assist with healthcare reforms and education about dietary choices.

Childhood and adult obesity has come to the forefront of health concerns, both in the United States and abroad. According to the U.S. Center for Disease Control and Prevention, obesity rates have doubled for adults and tripled for children since 1980. With current consumption patterns, 40 percent of American adults will be obese by 2015. A 2003 study by the World Health Organization (WHO) reported that 42 million children are overweight. Of equal concern are the rising health care costs that accompany the increase in obesity. As obesity rates increased from 18.3 percent in 1998 to 25 percent in 2006, healthcare spending increased by $40 billion a year to accommodate the treatment costs for weight-driven problems. Current healthcare spending for obesity-related issues is over $200 billion. The culprit for obesity is diets containing excessive fat, sugar, or salt, all which contribute to diabetes, heart disease, cancers, and other chronic diseases.

Solutions to the global obesity epidemic are increasing exercise and lowering consumption of less-healthy foods in favor of more nourishing counterparts. In 2004, the WHO adopted a global strategy on diet and physical activity to achieve this goal. Another WHO effort directed at children recommended limiting exposure to television advertising of less-healthy products and making schools and playgrounds free of marketing of junk food and sugary drinks. President Obama agreed that "if you wanted to make a big impact on people's health in this country, reducing things like soda consumption would be helpful." The biggest trial facing health advocates is implementing effective deterrents against purchase of unhealthy foods.

Taxation is a proven method of reducing consumption. Health and advocacy groups argue that the same taxation policies that successfully reduced adult and teenage smoking could be effective in preventing obesity. For example, a study of 5,115 patients concluded that an 18 percent tax on junk food would translate to about a five-pound annual weight difference per person. The British Medical Journal found that a "fat tax" could prevent up to 1,000 premature deaths from heart disease annually in the United Kingdom, as well as provide other benefits.

Besides lowering consumption of fattening foods, imposing an excise or sales tax would also generate revenues to compensate for the cost of health care for obesity issues. Taxation funds could be used to extend insurance coverage and to promote healthier eating habits. A study by the Urban Institute and the University of Virginia revealed that a 10 percent sales tax would raise $522 billion over 10 years. Even if a program to subsidize purchase of fruits and vegetables was instated, revenues would still reach $356 billion in the next 10 years. This tax option is attractive for legislators struggling to find sources of revenue for healthcare reforms estimated to cost as much as $1 trillion.

Document E

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Figure 5 Illustrates the transformation of Document E (indirect approach) into Document F (direct approach). As direct approach requires that the solution/conclusion be presented at the beginning, the only change was to move the highlighted paragraph to the beginning, creating Document F.

Greenhouse Gas Emissions

Sharp increases in greenhouse gases during the industrial era may have caused changes in the earth's climate, resulting in major environmental and economic impacts in the United States and the world. As part of a global movement to alleviate these changes, Congress has proposed numerous plans for greenhouse gas regulation, including a domestic emissions pricing system such as a cap-and-trade system or a carbon tax. Yet these measures may give foreign companies (without similar restrictions) a competitive advantage in energy-intensive industries.

High-energy companies can be negatively affected by greenhouse gas emissions regulations unless provisions are made to protect against international competition. Increased production costs accompany regulation and may cause output, profits, exports, or employment to fall. Some businesses may choose to pass the costs onto consumers through higher prices. International competitors, however, would not take on the same production cost increases, allowing them to sell goods at much lower prices—effectively gaining a larger market share because of this advantage. The most heavily impacted industries will be those with the largest amounts of greenhouse gas production. To prevent the failure of national companies due to increased foreign competition, the House of Representatives passed H.R. 2454 in June 2009, establishing a criterion for the Emission Allowance Rebate Program using levels of trade and energy intensity (Figure 1).

Criterion to Establish Vulnerability to Adverse Competitiveness

Criterion	Vulnerability	Definition
Energy Intensity	≥ 5%	Cost of energy expenditures divided by the value of shipments
Trade Intensity	≥15%	Ratio of the sum of the imports and exports to the sum of the shipments and imports

To qualify for special treatment due to vulnerability to greenhouse gas regulation, industries must be both relatively energy- and trade-intensive as defined by H.R. 2454. As Figure 1 explains, under the proposed criterion, energy intensity, or the cost of energy expenditures divided by the value of shipments, must be 5 percent or greater. Trade intensity, or the ratio of the sum of the imports and exports to the sum of the shipments and imports, must be 15 percent or greater. In 2007, energy- and trade-intensive industries made up about 4.5 percent of domestic output, largely in primary metals, nonmetallic minerals, paper, and chemicals.
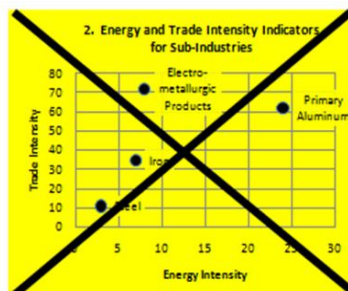
Yet even within these primary industries, sub-industries show high variability. Figure 2 illustrates sub-industries within primary metals, giving examples of the variability to be found in just one industry. For example, although primary aluminum far exceeds the criteria with an energy intensity of 24 percent and a trade intensity of 62 percent, others (such as steel) fall short of one or both of the requirements—steel has an energy intensity of 3 percent and a trade intensity of 11 percent.

Industries that meet both the energy- and trade-intensity criteria are considered especially vulnerable to greenhouse gas emissions regulation, because of the potential impact of foreign competitors on the market share. Iron and steel are an ideal example of this danger. Since 2002, iron and steel mills and manufacturers have shown a growing reliance on Chinese imports, largely due to lower labor and capital costs found in Chinese counterparts. Figure 3 (below) shows the increase in Chinese imports as a percentage share of total U.S. imports in sub-industries of the primary metals category. Even without additional greenhouse gas emission regulation, Chinese imports already hold a dominant role in the local industry. Competitive effects from emissions pricing could increase this already growing share if vulnerable industries are not protected against foreign competition.
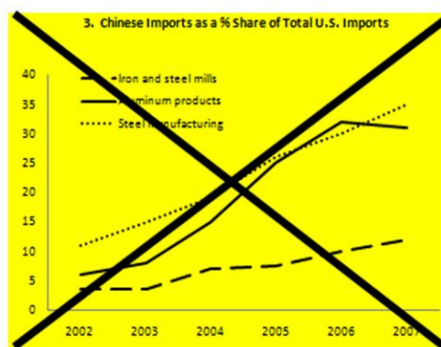

Figure 6 Shows the steps taken to change Document G (above) into Document H (right). Removing the highlighted portions from Document G resulted in Document H, without visuals.

Greenhouse Gas Emissions

Sharp increases in greenhouse gases during the industrial era may have caused changes in the earth's climate, resulting in major environmental and economic impacts in the United States and the world. As part of a global movement to alleviate these changes, Congress has proposed numerous plans for greenhouse gas regulation, including a domestic emissions pricing system such as a cap-and-trade system or a carbon tax. Yet these measures may give foreign companies (without similar restrictions) a competitive advantage in energy-intensive industries.

High-energy companies can be negatively affected by greenhouse gas emissions regulations unless provisions are made to protect against international competition. Increased production costs accompany regulation and may cause output, profits, exports, or employment to fall. Some businesses may choose to pass the costs onto consumers through higher prices. International competitors, however, would not take on the same production cost increases, allowing them to sell goods at much lower prices—effectively gaining a larger market share because of this advantage. The most heavily impacted industries will be those with the largest amounts of greenhouse gas production. To prevent the failure of national companies due to increased foreign competition, the House of Representatives passed H.R. 2454 in June 2009, establishing a criterion for the Emission Allowance Rebate Program using levels of trade and energy intensity.

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