

University of Alberta

Is the New Paragraph More Readable than the Traditional Paragraph?

by

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Dedication

In memory of my friend Guy Kremer: 1969-2002.

Abstract

The definition of the traditional paragraph has remained unchanged for generations of readers. Yet today the predominant form of the paragraph on the Web is so new that it can only be called the new paragraph. So the question is which is the more readable of the two paragraph formats? More specifically, how can the new paragraph be defined and how can its readability be measured against the traditional paragraph? A literature review reveals that no attempt has ever been made to define the new paragraph. A novel approach is taken: collect the headline stories from the top 43 English language online daily newspapers and use them to define the new paragraph. They exclusively use the new paragraph format and 1200 stories were collected from them over a period of four months. The results indicate a drastic difference between the old and new paragraph with the new paragraph being on average less than half the size of the old paragraph. Whitespace between paragraphs occupies almost exactly half a given story. Words of less than two syllables are the norm in a new paragraph.

To determine the readability of the new paragraph, a test of readability was performed using human subjects. A passage of text was selected and formatted according to the rules for the traditional paragraph and according to the metrics of the new paragraph. The cloze procedure is then used to decide readability. The reading test's data is analysed and the results and future directions of the study are discussed in the conclusion.

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1. Chapter 1 - Readability and the New Paragraph

1.1. Introduction to Readability

A study of readability begins with an understanding of how the eye moves across a page.

Consider the first situation where the elements on the page are similar in nature and regularly distributed. A Gutenberg diagram can be used to describe the movement of the eyes across the page as seen below (Lidwell, Holden, & Butler, 2003).

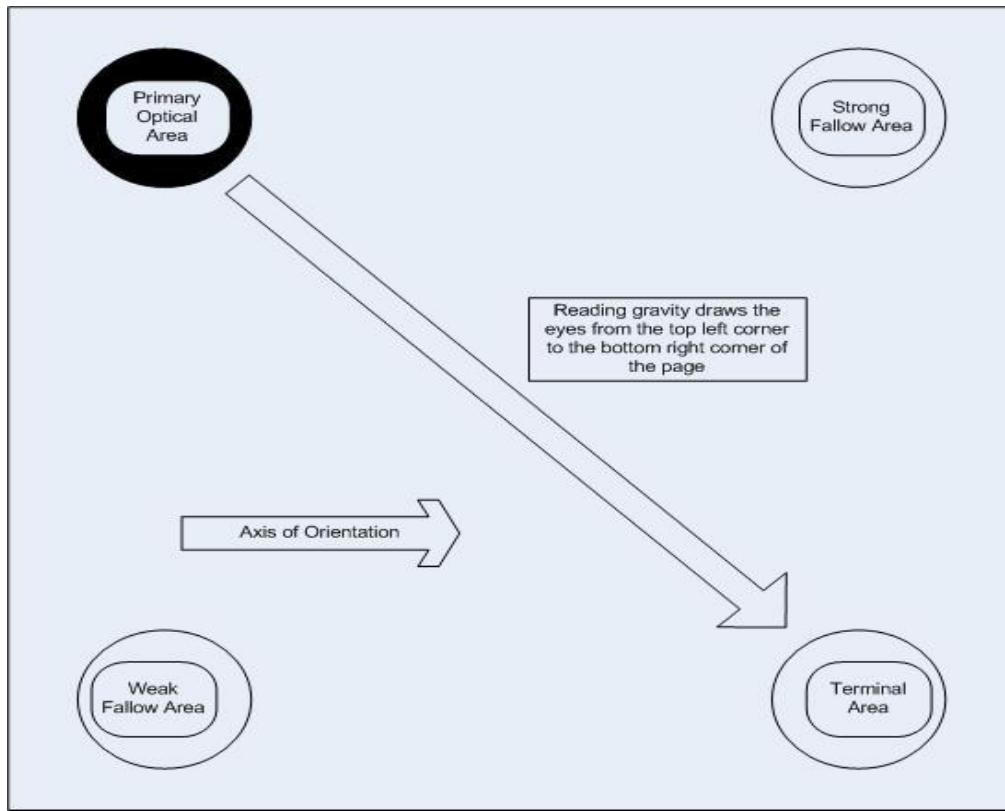


Figure -- The Gutenberg Diagram

Its four corners describe the page. In Western reading, our point of attentional entry (Lidwell, et al., 2003) into the page is the top left, the Primary Optical Area. Readers read in a series of swathes, from left to right, across the display space until they arrive at the Terminal Area. Each swathe starts along an axis of orientation, a horizontal line made by lines of text, layout elements, etc. The fallow areas lie outside this path and without visual reinforcement will receive the least attention. Reading Gravity is the practice of following this top-left to bottom-right path.

The Gutenberg Diagram is only predictive of heavily texted pages and evenly distributed comparable items such as blank pages and display pages. There is little evidence that it improves readability (Lidwell, et al., 2003).

1.2. Readability – Eye Movement Studies

To understand readability, one must understand eye movements during the reading process; reading is a particular instance of cognitive processing. While one reads, processes a scene, or looks for some physical object, one makes small eye movements called saccades. Between saccades, the eye makes fixations of 200-300 milliseconds. During these saccades, no new information is obtained since the lack of a fixated point causes visual information to blur. There are other eye movements besides saccades but for processing input information, saccades are of primary importance. For silent reading, the average saccade size is eight letters (Rayner, 1998).

Before each saccade there is a cognitive latency period whilst the brain decides where to move the eyes next. A number of factors that come into play at this point; it is here where the cognitive landscape meets readability. Letters form words, words form sentences, and sentences form

paragraphs. Of primary interest in this thesis is the readability of the traditional paragraph versus the new paragraph. The traditional paragraph is a structured group of sentences with the first sentence considered the topic sentence of the paragraph. Several sentences follow providing support and details to the first sentence. Lastly comes a concluding sentence as the last sentence in the paragraph (Anonymous1, 2008). The traditional paragraph can be any length with 4-5 sentences being average. The attentional entry point into a traditional paragraph is a single tab space in the first sentence, one or more blank lines above the paragraph, or both.

1.3. The New Paragraph – A Description

Lacking a definition for the new paragraph, a description is in order. Who are the readers? The new paragraph is in wide use throughout the Internet. Specifically, the new paragraph is practically the only paragraph used exclusively used in the headline stories of the top 43 by circulation English language daily newspapers in the world. It is used in the official home page of the United States Army (Anonymous2, 2010) and in the United States Department of Defence (Anonymous7, 2010) website. In the health sector, the new paragraph is used throughout the not-for-profit Mayo Clinic website (Anonymous3, 2010)and the United States Department of Health & Human Service website (Anonymous4, 2010).

So where are the readers located? The daily newspaper's circulation base is in India, United Kingdom, United States, Australia and Canada. Online demographics for newspapers are difficult to obtain and where available are not used for decision making within a newspaper

organization. Also, unlike a real world newspaper reader, it's hard if not impossible to separate browsing behaviour from reading behaviour (Usher, 2009).

What does the new paragraph consist of? An empirical definition of it is presented in the next chapter. Journalism stories are commonly structured around the inverted pyramid structure. A story structured around the inverted pyramid begins by answering the who, what, where, when, why and how as quickly as possible. It then proceeds to detail less important facts. From a Journalism point of view, this format makes it easier for editors to crop a story; they start at the bottom of the page and proceed upwards from less to more important story details. Other formats are also possible such as the chronological, narrative, and thematic (Scanlon, 2003; Foust, 2009). What is important here is that these formats use the new paragraph in online newspapers. This then raises a new question: Which paragraph has a higher readability for a low or high knowledge reader?

1.4. How to Write a New Paragraph

The next question is how would one go about writing a new paragraph? Consider this example:

(a) "With authorities in high alert for potential terrorist threats, police today arrested a German man with an assault rifle in his luggage soon after he arrived at London's Heathrow airport, prompting the evacuation of one of the airports terminals"

(b) "Police have arrested a man with an assault rifle at London's Heathrow Airport."

"The arrest led to the evacuation of one of the airport's terminals, as authorities are on heightened alert for terrorist attacks."

The format used in (a) is for a fictitious wire story whereas in (b) the story has been rewritten for the web. Now the story highlights are in the first paragraph followed by less important information in the second paragraph. The remaining paragraphs would fill in the rest of the details. This results in many short paragraphs with blank lines between them and ergo longer stories (Foust, 2009). So is the new paragraph more readable than the old paragraph? Keep in mind that there are more attentional entry points in a story made of new paragraphs. What happens to readability when the two paragraphs are mixed? Is there more context in the traditional paragraph or in the new paragraph? Here, context refers to the words that immediately come before and after a word or passage and clarify its meaning.

1.5. Readability and the Cloze Procedure

At this point a definition of readability is in order. Dale and Chall (1948) proposed the following comprehensive definition of readability: In the widest scope of definition, readability is the grand summation (combined with intercommunication) of every item within a specified section of printed communication that influences the accomplishments that a reader community has with it. The level of accomplishment is based on: how well they understand it, read it at an accordingly optimal speed, and of course, find it interesting (Gilliland, 1972). The most well known form of readability measures are readability formulas. According to Klare (1963), the first recorded measurements of readability were done in 900 A.D. by the Talmudists. They used the concept of word counts and idea counts so that repetitiveness could be used to separate usual from unusual meanings (Booher, 1971). Today, at least 31 readability formulas exist, and a

review of them is beyond the scope of this thesis. That being said, a simple example illustrates the limitations of reading formulas:

- 1a) He waved his hand.
- 1b) He waived his rights.
- 2a) The dog lay on the rug.
- 2b) On the rug the dog lay.

Sentences (a) and (b) score the same using readability formulas; sentence (b) is more complicated.

Fortunately, a more human orientated measurement of text comprehensibility can be found, namely the cloze procedure. It is the cloze procedure rather than readability formulas that is considered the “criterion of choice” for evaluating the readability of adult reading material (Samuels & Zakaluk, 1988). Over time the cloze procedure has been accepted by the education community as a “very reliable measure and objective means” of measuring directly the comprehensibility of written material in general (Haar, 1990). Furthermore, after a lengthy study, the International Reading association has pushed for the use of the cloze procedure to measure readability. Note that the International Reading Association is the professional association in the field of reading (Klare, 1988; Stevens, Stevens & Stevens, 1992). Samuels and Zakaluk (1988) introduced the cloze procedure to evaluate the respective understanding and readability of written communications. The cloze procedure is especially useful for writers who have access to a representative sample of their intended audience. Its use is intuitive. Words are removed from a given section of text in accordance to a preselected strategy. The reader is then asked to fill in the blanks to reproduce the original text. And so, the cloze procedure measures

how correctly the reader can pick the words that match the meaning of the missing words in the section (Singh, Sumeeth, & Miller, 2009).

1.6. A Literature Review

1.6.1. The Understanding of Sentences (Thorndike, 1917)

The review begins with the first study in comprehension based on experimental data done by Thorndike in 1917. What he found was that subjects were not able to fit together separate ideas in a paragraph nor were they able to use joining terms like “but” or “on the contrary” to form proper relationships between individual words or different groups of words. In his words:

“Understanding a paragraph is like solving a problem in mathematics. It consists in selecting the right elements of the situation and putting them together in the right relations, and also with the right amount of weight or influence or force for each.”

Thorndike in his paper also makes the case that good readers find answers that not only fit the question, but that fit the paragraph also (Thorndike, 1917, p.114).

1.6.2. Reading a newspaper versus a net paper

Moving decades ahead, the next article examined is “Reading or Scanning? A Study of Newspaper and Net Paper Reading” (Holmqvist, Holsanova, Barthelson, & Lundqvist, 2003). The first point to consider is how the traditional media and the new media are read and how they fit into the reader’s lifestyle. Online newspaper readers describe their reading behaviour as follows: Sitting down with a real newspaper is a pleasurable undertaking and done where there are as few distractions as possible e.g. breakfast table, coffee break, on the subway. It is a tactile, pacifying activity; one flips through the folds and takes one’s time perusing the events of the day.

Contrast this to net paper reading: It is done in short bursts, like the time between answering emails; net paper reading is done in one's office in the early morning or at lunchtime. Usually one is trying to get updates on a couple of pertinent issues and one is likely to visit news sites at least a few times a day with the objective of getting a quick outline of the days happenings. Further details of this behaviour can be found in Holmqvist, Holsanova et al. (2003).

In a readability study done by Garcia, Stark et al. (1991) and published in 1991, the findings were that readers do not read newspapers. On the contrary, they scan them and at specific entry points, they stop scanning and start reading. Readers enter the page via a dominant photo, a headline text, or even editorial text. The authors argue that this is powerful proof against the inverted pyramid structure which states that the most important information should be given the most space and put at the top whereas less important information goes further down. Instead, the authors make a case for using creative graphical elements as entry points instead.

Garcia, Stark et al. also quote a paper by published by Hansen in 1994. Hansen studied 12 readers of the Danish newspaper *Det Fri Aktuelt*. His research shows that only short articles get read completely and the longer the article, the less of it is read. His results resemble Garcia and Starks in that as little as 25% of articles get read and a mere 12% are read past half their total length. Another study (Lewenstein, 2000) goes against Hansen and Garcia, Stark et al's findings. First of all, they found that online news articles are read to a depth of 75% on average in contrast to 12% read past half their length in a newspaper. Fixations on the first page of a net newspaper are 78% text as opposed to photos or graphics. What this means is that online newspaper readers center on captions, and article briefs rather than domineering visual elements on the page. Once again, this is directly opposite to the findings of Garcia, Stark et al. (1991) and Hansen who found that photos and images are the chief entry points in newspapers.

A brief contrast of reader behaviour between a newspaper and an online net paper is in order at this point. Scanning a newspaper is done to find entry points; if nothing of interest is found, the reader does not continue to scan the fold, instead they turn the page. For folds with reading rates below 15%, this occurs 3-5 seconds later. Contrast this to the design of a net paper. You do not have the option of turning the page in a net newspaper so you must keep scanning. Net newspapers pick their own route through the material, and hence the bulk of net newspaper pages are never seen (Holmqvist, et al., 2003).

So are net papers or newspapers more efficient? Keep in mind that net papers are exclusively in the new paragraph format. Readers of a net paper can pick and choose which stories they read by clicking only on stories that interest them. This would mean that net papers are more efficient. From this viewpoint, the reader takes a linear approach to the newspaper, turning pages and perusing material that was laid out in an order chosen for them by the newspaper designers. In order to find interesting stories they scan or read stories they normally would not in a net paper. Thus, the reader spends more time reading and less time looking for something to read, and if this is how one defines efficiency, then newspapers are more efficient.

As mentioned, the linear architecture of the newspaper encourages linear browsing. In net papers most articles never get opened. Unlike linear browsing, most stories have to catch the reader's attention by way of links on the front page. It is intuitive that a link is a far inferior way to catch reader attention as it presents next to no information on the story in comparison to a newspaper designer who has laid out the story across a page. This may be the reason why net paper readers have to scan more and why they get bored so quickly. Readers also have to follow story links to get further story details. As they do, they report feeling they have lost the main trail and that only the front page provides reliable entry points (Holmqvist, et al., 2003).

1.6.3. Net Papers Cater to Reader Interests

In the article “Differences in knowledge acquisition among readers of the paper and online versions of a national newspaper” (Tewksbury & Althaus, 2000) the authors state that online newspapers have an advantage in what they provide as important cues to online news stories that can markedly direct reader attention. In a story about Israeli spies in Switzerland when net paper editors provide up to the minute coverage of the story, readers have the interest and ambition to follow their lead. In a similar process when online news provides fewer cues than their newspaper counterparts, readers are more likely to follow their own interests as the selective criteria. In this article, the authors go on to state that net papers have an advantage in organizing stories topically and with supplementary information (Tewksbury & Althaus, 2000). However, regarding the last point, the footnote on this passage is dated from the 1988 article “Processing the news: How people tame the information tide” (Grabner, 1988). It is reasonable to ask how something published even before the infancy of the Internet applies to modern day net papers. The reason it is used here is that it still makes a relevant point.

1.6.4. Reading Theory and Cognitive Wrap Ups

In Just & Carpenter (1980) the authors describe a unique reckoning episode that occurs at the end of a sentence. This is of particular interest to this study since sentences are the obvious building blocks of the traditional paragraph. This reckoning episode is identified not as a stage of processing but by the attribute of being activated by the end sentence terminus. Sentence terminuses have two features that make them particularly good places for the integration of details. They are disambiguation and identity resolution.

Disambiguation is the process of clearing up ambiguities within the sentence. For example, if a new identity is introduced into the sentence and prior context does not make the identity clear, a clue as to their identity can be found by the sentence terminus. It has been shown by independent research that readers in fact do use the sentence terminus to wrap up irregularities that they cannot process inside the sentence structure (Davis, 1972). For example, disambiguation occurs at the last word in this sentence: “When he came into the room he shook hands with everyone, bought them drinks, and everyone called him James.”

The second feature is that a sentence terminus absolutely signals the end of a thought and the start of a new thought. This can be contrasted against cues that are not as strong such as conjunctions, commas, and relative pronouns; they are ambiguous because they can indicate something other than the end of a clause. Sentence terminuses are unambiguous; they perform the same task across sentences, and can be dealt with more consistently than cues found within sentence-clause boundaries.

There are plenty of empirical findings that support the wrap-up process at the end of a sentence. For example, a study by Carpenter and Just (1977) showed that when a word based inference must be done to connect a new sentence to an earlier piece of text, there is a strong inclination to pause at both the word in doubt and again at the end of the containing sentence. Below is an example. The two paragraphs contain related sentences; in the second sentence, the first noun refers to the subject of the verb in the first sentence:

- “(1a) *It was dark and stormy the night the millionaire was murdered.*”
- “(1b) *The killer left no clues for the police to trace.*”

Phrased slightly differently, the collating inference is less direct:

- “(2a) *It was dark and stormy the night the millionaire died.*”
- “(2b) *The killer left no clues for the police to trace.*”

Sentence 2b took 500 milliseconds more to process than 1b. It is assumed that it is because it is harder to link the inference of *killer* to *die*. The reader paused at the word *killer* and again at the sentence terminus for a total of 500 msec. Another fixation study by Carpenter and Just (1977a) found that pronoun unification with its antecedent occurs either when the pronoun is first encountered or at the finish of the sentence that contains the pronoun.

Now that the wrap-up process has been examined, consider how it could apply to text units smaller or larger than the sentence. For example, there is evidence that suggests wrap-up processes occur at the end of clauses. Of interest to this thesis is the possibility that wrap-up could occur at the paragraph terminus. Deciding “when” and “if” to wrap-up may be determined by the reader’s desired processing depth. For example, skimming or speed-reading may need wrap-up only at paragraph terminuses whereas a legal document may require wrap-up at clause terminuses. In this study there is some evidence that paragraphs might also be wrap-up points receiving 157 milliseconds of fixation at their terminus.

It is clear that there is no one solitary method of reading. Reading depends on what is being read and why reader is reading it. Reader objectives are likely the most important factor of the process of reading. Examples of different objectives may be skimming a passage for its main points, memorizing a section of text, or reading for enjoyment. Reading theory requires that goals be satisfied or at least attempted before moving on to the following word, clause, or sentence. Goals can be added or deleted. For instance, a goal of extracting interpretation from a lexical unit might be supplemented by a goal of memorization by repeating phrases. On the other hand, a speed reader might drop the goal of syntactic agreement because speed reading destroys the idea of syntactical coherence. Note that with current practices, tests, and techniques these reading goals can be detected. What is of interest here is that when readers expect a

comprehension and recognition test as opposed to a recollection test, they spend less time with detail integration (Carpenter & Just, 1977a). This, by the way, is an additional caveat to using the cloze procedure. By definition, this makes this readability test more “readable” itself. This is an original finding of this thesis.

In addition, reading also relies on the text, the subject matter, and the reader’s awareness of both of them. A paragraph that is written well and on a familiar subject will be effortless to get through at all levels of comprehension. Lexical units (e.g. words) will be easier to put together, ideas will be recalled with less effort, and inferences and interrelations are carried out with less exertion. Note that this spectrum of variation can be easily accommodated, measured, and analyzed within existing theoretical frameworks.

Just and Carpenter (1980) also make it clear that reading varies from person to person, even if they are reading the same text. One conceivable explanation is the operating capacity of working memory. A reader with a large working memory could hold larger pieces of text while assimilating new text making the integration of the whole more thorough. Note that this may depend upon how systematically readers apply fundamental reading processes such as lexical access and encoding. Poorly skilled readers may exert more effort and concentration with these processes and thus have a reduced capacity for previous information and integrating incoming material (Just & Carpenter, 1980).

1.6.5. Chapter Summary

Despite the lack of proof as to the effectiveness of the Gutenberg diagram, its use is widespread in Journalism and literary arts teaching materials and is frequently encountered in literature searches. The basic guideline given by most but not all sources is not to follow it naively. An understanding of eye movements provides the fundamental mechanics of reading.

Following that, a description of the new paragraph is provided along with a description of how to write one; most Journalism texts focus on practice writing versus definition to understand the new paragraph. The next topic covered is readability and the cloze procedure. Despite their widespread use in organizations like the Internal Revenue Service and the United States military as an inexpensive means of gauging readability, reading formulas continue to be misused, abused, or not understood at all.

2. Chapter 2 - The Paragraph: A Narrative of Discovery

2.1. Introduction

This chapter is organized as a narrative in the third person. Since this is an exploratory work it was deemed that the narrative form was most appropriate. Discovery is not a linear or logical process that can be organized into logically cohesive units. Rather, discovery is a reflection on the thoughts and the journey that led to the circumstances of here and now. So a free flowing format is the most appropriate style.

2.2. The Beginning

The new paragraph begins with the observation that the type of paragraph used on the Web is consistently similar across different web sites. A casual investigation by the researcher across a number of web sites reveals that there is something to this notion. The first task was to identify the paragraph commonality in a single area. The question was which area to select? First the health sector was investigated and a commonality in paragraph types was noted. Next the defense sector was examined and again the similarity was noted. Then Journalism was reviewed and chosen because of its 400 year history with the written word.

As a starting point, the history of the new paragraph begins January 19, 1996 when The New York Times went online, allowing readers to view their articles and photos from anywhere in the world on the night of publication (Anonymous6, 2010). Interestingly, a search of The New York Times archives (Times, 2010) for articles published on January 20, 1996 reveals that a number of articles on the first page of the search results were in the new paragraph format. So the researcher will take this to be the practical birthplace of the new paragraph. In 1996 this might have been

one of the few places to find credible Journalism. Nowadays, much of Internet Journalism comes from other web Journalism and that the creation of its content is determined by the visceral logic of the Internet itself and not by other disciplines (Monaghan & Tunney, 2010). What this tells the researcher directly is not to believe everything he reads in web journalism.

Consider the function of form and style in Journalism. The key to public trust is a journalist's claim that something is true. Contrary to popular belief, it is not just the content of the news that makes people believe that a newspaper's representation of events and issues to be valid. It is also form and style as discussed by Rupar (2010) in her book of essays on Journalism. The new paragraph is part of this form. So considering the form and style of the new paragraph, one can ask the question, can the form and style of the new paragraph be numerically objectified as well?

It can be stated that readers are used to the performative power of text, not just in its content but mainly in its form and style. An example that is as well known as it is extreme is the 1938 broadcast of "The War of the Worlds" (Wells & Ó Broin, 1934) narrated by Orson Welles. The radio play was identical to news bulletins in both style and form. Since radio listeners were accustomed to hearing news bulletins every day, they believed what they heard (Rupar, 2010). The next day, The New York Times reported that the broadcast had "led thousands to believe that an interplanetary conflict had started" (Cantril, Koch, Gaudet, Herzog, & Wells, 1940).

In regard to style, it is worth mentioning that according to the sociological school of Journalism studies, a style element is considered an isolated incident until it is routinely practiced. For example, the inverted pyramid was considered rare in the 1865-1885 time frame, but was nearly universal after 1925. Its appearance is considered a significant milestone in new beginnings (Rupar, 2010). This leads to a number of interesting thoughts about the new

paragraph. If its online appearance in 1996 marks its beginning and its widespread use has already been noted, how long before it is considered a style element unto itself? Are we witnessing the birth of a new style element, one that has been numerically objectified?

Here is another point to consider about the spread of the new paragraph. The New Zealand Press Association was founded as a cooperative to provide its members with news stories. It used to share copy with its members until 2006 when it reinvented itself as corporate entity that sells news to whoever wants to buy it. Many analysts have noted that centralized news media proprietorship has led to the undemocratic outcome of having fewer and fewer diverse voices in the news media (Rupar, 2010). Commercialization means reducing costs and reducing costs can be accomplished by using a semi-standard reporting format, namely the new paragraph. Here, the relevance of the new paragraph is: will its use save money for an organization?

How long does it take to get used to the new paragraph style of reporting in a newspaper article? Put another way, when does a reader start believing that news reported in the new paragraph style is credible? This was a question the researcher directly encountered early on in the study, in reading dozens of online newspapers daily. Web users are at a disadvantage in that most web articles are planned as newspaper articles and by virtue of their length seem odd in those circumstances. Links to the print or audiovisual source for the web story are not available (Rupar, 2010). So for a new reader to an online daily, at what point does news reported in the new paragraph become as credible as news reported in the traditional paragraph format? The researcher's experience is that in the end it did not matter what form the paragraph was in. What mattered most was the content of the newspaper he was reading.

In a literature review on Journalism, one quotation stood out more than others. It was made by Alvin Toffler about 30 years ago. He said we are moving from “a few messages sent to many people to many messages sent to a few people”(Toffler, 1980). Indeed we are being bombarded by messages, however, media and their clients aka advertisers want to maximize the potency of their message. So for that reason, clear and concise writing still matters, no matter how much technology is being used to reach consumers (Meyer, 2009).

A problem the researcher encountered early on was how to reliably count paragraphs using software. Technology brings with it valid measures of its success. However, what is valid is not necessarily reliable. Reliable in this sense, refers to the extent to which different judges on the whole will come to the same conclusion. For example, computers allow us to sift through huge volumes of data. Computer programs however, cannot always provide the same answer using valid algorithms. In fact different versions of the same software cannot even agree on their metrics. Different releases of Microsoft Word produce different readability scores for the same passage of text and they are all using the same formula (Meyer, 2009). What does that say about analyzing the new paragraph using this popular word processor? Often, it cannot even come up with a valid or reliable count of the number of paragraphs in a story. In the end, the researcher had to develop custom software to accomplish this task.

To give a pragmatic example of the use of readability scores, consider the following examples. John F. Kennedy’s speech “ask not what your country can do for you, ask what you can do for your country” scores at 10.3. William Faulkner’s Nobel Prize acceptance speech “I refuse to accept the end of man” scores at 8.8. Patrick Henry’s famous speech “Give me liberty or give me death” scores at 6.6 (Meyer, 2009). Medical texts are an interesting challenge as four letter words like “cyst” have complex meanings and so different reading formulas are used to grade medical

articles. Interestingly, Faulkner holds a record for the world's longest sentence at 1,287 words in his novel *Absalom, Absalom!* (Faulkner & Herman Finkelstein Collection (Library of Congress), 1936). It is, of course, in the traditional format.

What is also interesting is that big city newspapers have a tendency to write more densely than small newspapers. The theory behind this is that small town newspaper reporters are closer to their readers. Reporters in big cities feel they are in danger of being socially cut off, and so they write for one another instead of for the general public. And in doing so the grade level increases, which affects the paragraph readability directly. Small town newspapers also have a lower capacity (number of reporters, columnists, etc.) than big city newspapers, but it does not have a discernable effect on readability (Meyer, 2009).

It may seem reasonable to assume that readability is part of quality in Journalism. According to (Meyer, 2009) measuring quality in Journalism is like measuring love. According to philosophers, you cannot measure love but we know it exists. Well, anything that affects human behaviour can be measured, although perhaps not directly (Meyer, 2009). Might not the readability of a paragraph, traditional or otherwise, be the same sort of measure for the quality of Journalism in a newspaper? Then again, maybe not if the newspaper is trying to "redline".

A lot has been said about readability being the key to a successful newspaper. However, there is another side to contemplate. What if newspapers made it more difficult to read their articles in an effort to "redline"? That is to say, they make their stories more complex so that they can pitch sales to highbrow clients whose market is the highly educated and well off. Certainly the reverse is true with newspapers like the UK edition of *The Sun*, and is done so without violating many of the rules of Journalism. Well, in our case the amount of advertising revenue each paper received

told the true story. If a newspaper redlined then it would have fewer advertisers paying more money for advertising space, but this was found not to be the case (Meyer, 2009). What this means is readability alone cannot be used a quality metric for Journalism without considering the readership for which it was intended. Similarly, it's reasonable to take readership into account when discussing the readability of the new or traditional paragraph.

After a literature search of Journalism articles relevant to this study, the researcher finds that it is possible to raise many more issues regarding the paragraph format. However, that conclusion is drawn from the researcher's experience with Journalism and Engineering; questions are being asked that a literature search cannot provide answers for. Asking questions is not easy; on the one hand, the issues raised have to be presented with a certain engineering rigor and on the other hand, with an editorial rigor quite like that of Journalism. Looking forward to the future of the new paragraph it is important to remember that Web Journalism is governed by the visceral logic of the Internet. So too, is the internal logic of the new paragraph.

As an aside and an important social note, not all societies have enjoy freedom of speech (e.g. China, Slovenia) and that affects the content of the story and the paragraph. Many of those in jail are bloggers; might the new paragraph format provide a type of anonymity? In closing, this researcher will leave the reader with two famous quotes by the Canadian scholar Marshall McLuhan. The first is "The medium is the message" and the second "In fact, the discovery of movable type was the ancestor of all assembly lines" (McLuhan, 1967)

3. Chapter 3 - A Readability Test and the Statistical Results

3.1. The Research Question

In layman's terms, the research question could be stated as: Is the new paragraph more readable than the traditional paragraph? In this chapter the researcher will re-state the question more specifically. The research objective is to reduce the ambiguity as to which paragraph type is more readable by numerically objectifying the new paragraph and using the results to perform a reading test on human subjects to provide statistical results as to which paragraph is more readable. Note that the objective is to reduce and not eliminate ambiguity because there is always the issue of human preference. This chapter will cover the results of the readability test and Chapter 4 will cover the numerical objectification of the new paragraph.

3.2. Piloting the Readability Test Design

Piloting any test that uses the Internet is a must. Several trial articles were prepared for the reading test and presented to volunteers. Based on their feedback, style sheets were updated, written material revised, and a sample web page set up to be used one-on-one in explaining the reading test to subjects.

3.3. Obtaining Ethics Approval

A Request for Ethical Review of Activities Involving Human Subjects application was made to the Faculty of Engineering Research Ethics Board and returned to the researcher with the status

of approved. In addition to the application, The Faculty of Engineering Research Board requires that an Information Letter and a Consent Form on the appropriate letterhead be submitted also. The Board highly recommends the use of their template and so it was used. Copies of the Information Letter, and Consent Form can be found in the Appendix G and Appendix H respectively. The Faculty of Engineering at The University of Alberta does not require that the Application for Ethical Review be included in a thesis document.

3.4. Subject Selection

In the end a list of students, professors, university staff, and associates was drawn up as potential subjects. They were approached directly by the researcher and asked to participate in the experiment. Often, the experimenter was introduced to new subjects through an existing subject and so it was not always necessary to follow the list. The researcher always introduced himself first and explained that he was doing a readability test for his Master's thesis. It was also explained that it was not a test of the subject's English ability, rather the readability of a document. The participant was given a list of instructions and the instructions read to them. This is accordance to the guidelines laid out by The Faculty of Engineering Research Ethics Board.

Debriefings were kept informal in order to obtain a candid response from the subject as possible. Debriefings began with the question: "So what were your thoughts overall?" No attempts were made to curtail the subject's responses; they were allowed talk as long as they wanted.

3.5. Sampling Process

There were several considerations in choosing sampling techniques. One was that the study needed responses from people who are mostly under time duress. Also, subjects were unlikely to participate in a study where they were not approached directly. Needless to say, this makes it difficult to obtain a random sample. Still, the nature of this study is exploratory and so availability sampling was chosen as the sampling method. Circumstances and a similar rationale for availability sampling can be found in (Sim, Clarke, & Holt, 1998).

Availability sampling is a method of choosing subjects who are available or easy to find. The primary advantage of the method is that it is very easy to carry out, relative to other methods. There are some advantages to this design - it is easy to do, particularly with a captive audience, and in some situations, you can attain a large number of interviews through this method. The primary problem with availability sampling is that you can never be certain what population the participants in the study represent. The population is unknown, the method for selecting cases is haphazard, and the cases studied probably do not represent any population. Despite the known flaws with this design, it is remarkably common. Ask a question, give a web site address (Go now to RaviInderSingh.com), announce results of poll. This method provides some form of statistical data on a current issue, but it is entirely unknown what population the result of such polls represents.

While it is tempting to move beyond availability sampling, this does imply that the researcher has knowledge of the sampling frame for his hypothesis. In the current situation, the researcher

would need to understand and be able to quantify the co-variants to reading ability of potential subjects

on the Internet. Since, the Internet is global, these co-variants need to hold worldwide. In addition, theoretically, since co-variants need to be objective in nature (e.g. do not vary with time), the population required to be considered for the sampling frame is the entire of population of the planet past, present and future, constrained by their ability to access the Internet.

The researcher argues that given this definition of sampling frame that no known co-variants exist, which are causal and empirical proven, to influence the variables within the hypothesis. And under these circumstances, the researcher is to utilize simple availability sampling as no guarantees can be given as to the existence of genuine co-variants. The use of acceptance sampling simplifies the subject recruitment process – maximizing the probability of the researchers been able to recruit sufficient numbers of subjects. Availability sampling, also minimizes the impact on each subject, as the researchers are not required to under any “demographic” analysis, this should minimize the time to complete the experimental task, thus maximizing the completion rate, including maximize subject involvement and enthusiasm.

3.6. Overview of Readability Test Considerations and Administration

A reading test was conducted with 54 subjects to determine if the new paragraph is more readable than the old paragraph. It was decided to use random articles from a newspaper, in this case The New York Times, and to select articles with no modern relevance. That is to say if an article from today's newspaper was selected a reader might be able to guess its contents by

simply being aware of current events. So three articles from 1996, 1997, and 2003 respectively were selected from the news archives, they can be found in Appendices A through F. Next, a strategy for the cloze procedure was selected. In the literature, deleting every fifth word might seem appealing because of its simplicity, but in reality it does not work. Dates, ages, names, etc. cannot simply be guessed if deleted. Also, consider the following sentences.

- A) He has a pair of cards.
- B) He has a pair of shoes.

If the word ‘pair’ is deleted, in the first case it cannot be guessed but in the second case it can. So it is necessary to thoughtfully review the articles to prevent the deletion of certain words.

Three stories were selected in the traditional format. Then three versions in the new format were prepared. Having read more than 1200 online articles did more than prepare the researcher for this task. All the same, there were several points to consider when generating the new paragraph. The biggest was to make as few changes as possible to obtain the new format. The next was to establish a flow, a rhythm more like a conversation than a narrative for the new paragraph. The tense of a few verbs had to be changed but nothing significant. Perhaps it was the researcher’s previous experience with online newspapers, but translating the traditional paragraph into the new paragraph proved rather easy.

At this point six stories existed, three in the traditional format and three in the new format. Every fifth word was deleted from each story after ensuring no context words were removed and then answer sheets were generated. The stories were put online using a style sheet that ensured that the Times-New Roman Font was used with 18 points of space between paragraphs in each story. A random allocation table was generated so that each reader received one story in each

format and that no story was allocated twice in different formats. This was done to prevent bias; if a reader reads a story in the traditional format then for certain they are biased in answering the same story in the new format. All stories included their full newspaper title on their web page version.

Subjects were selected according to age, socioeconomic status, and geographical diversity in order to obtain a wide a sample as possible. Also a version of the reading test was prepared for telephone interviews to maximize the availability of subject according to area and according to their personal schedules. An information letter was given to each respondent and they were required to sign consent form. They were then given fifteen minutes to complete the reading test. Following the reading test, an informal debriefing of the subject was held.

3.7. Informally Debriefing the Subjects

It was decided to keep debriefings informal because this was an exploratory study and the candid feedback from subjects is invaluable for future work. The feedback from informal debriefings was very interesting. A significant group of subjects thought that the new paragraph was easier to work with. One reader commented that he was used to reading the new paragraph in online scientific newspapers so he found it easier to read the new paragraph. A few other readers commented that it was easier to use the new paragraph because English was not their first language. Another group found the traditional paragraph easier to work with for two reasons. One is that the traditional paragraph provided more content in the beginning to make it easier to fill in blanks later on. The other is that they were simply more familiar with the traditional paragraph.

Yet another group was in the middle of the road; they found neither paragraph definitively easier. One more group thought the subject matter was more important than the paragraph format. Another group found subject matter and then paragraph format determined the usefulness of the paragraph. Lastly there was a group that declined to make any comment.

Of the reading tests allocated, a few were made unusable by the subject requesting their data be withdrawn or the answer sheets were illegible. This means that all the stories were not allocated exactly the same number of times. In the end, 54 reading tests were successfully conducted over a period of two weeks and their results transcribed into a spreadsheet. What follows is a discussion of those results.

3.8. Numerical Results

The average and standard deviation of the cloze test results are shown in Table 1. The scores for stories 1, 2, and 3 in both traditional and new paragraph format were merged and their averages and standard deviations given below.

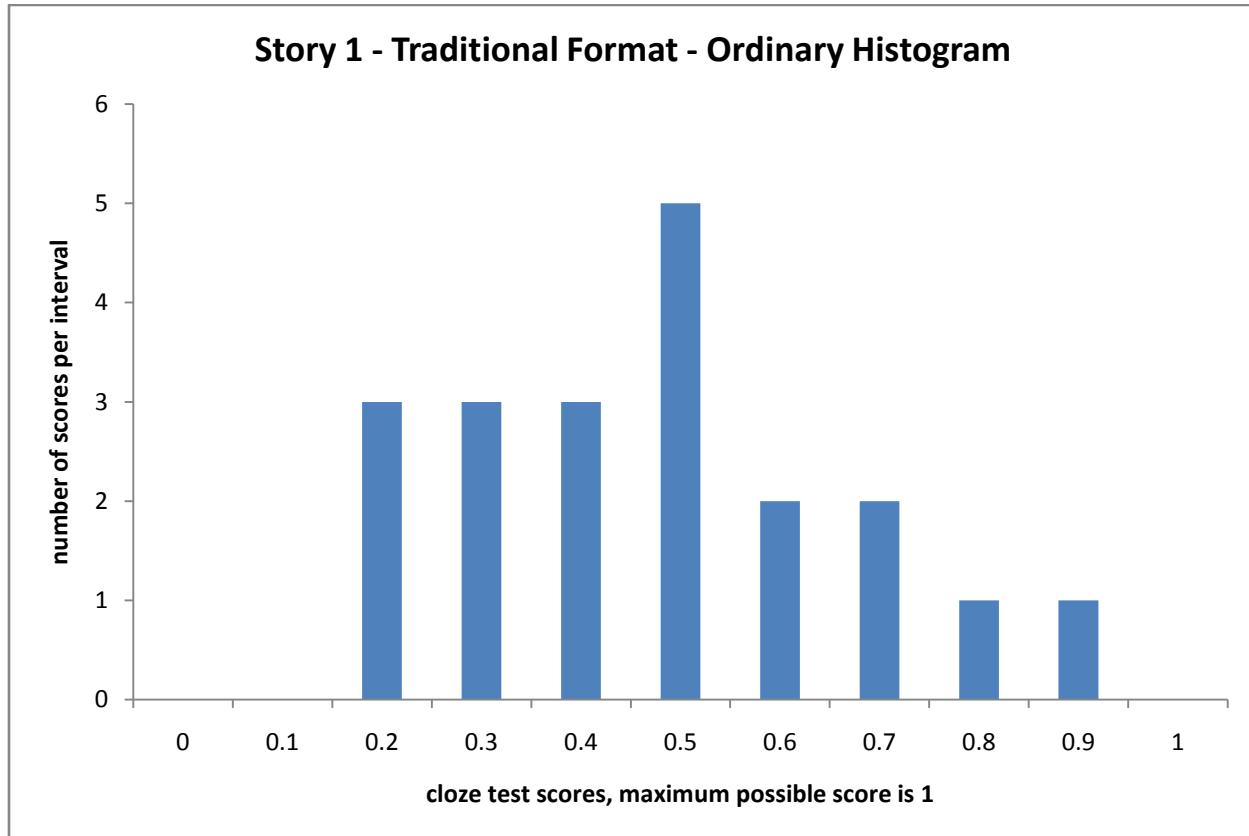
Table - Averages and standard deviations of cloze test scores for Stories 1-3 in Traditional and New paragraph formats

<u>Story</u>	<u>Paragraph</u>	<u>Average</u>	<u>Std. Dev.</u>
1	Traditional	0.42	0.19
2	Traditional	0.51	0.23
3	Traditional	0.46	0.16
	Average	0.46	0.20
1	New	0.33	0.23
2	New	0.42	0.23
3	New	0.53	0.24
	Average	0.43	0.24

3.8.1. Cloze Results for the Traditional Paragraph

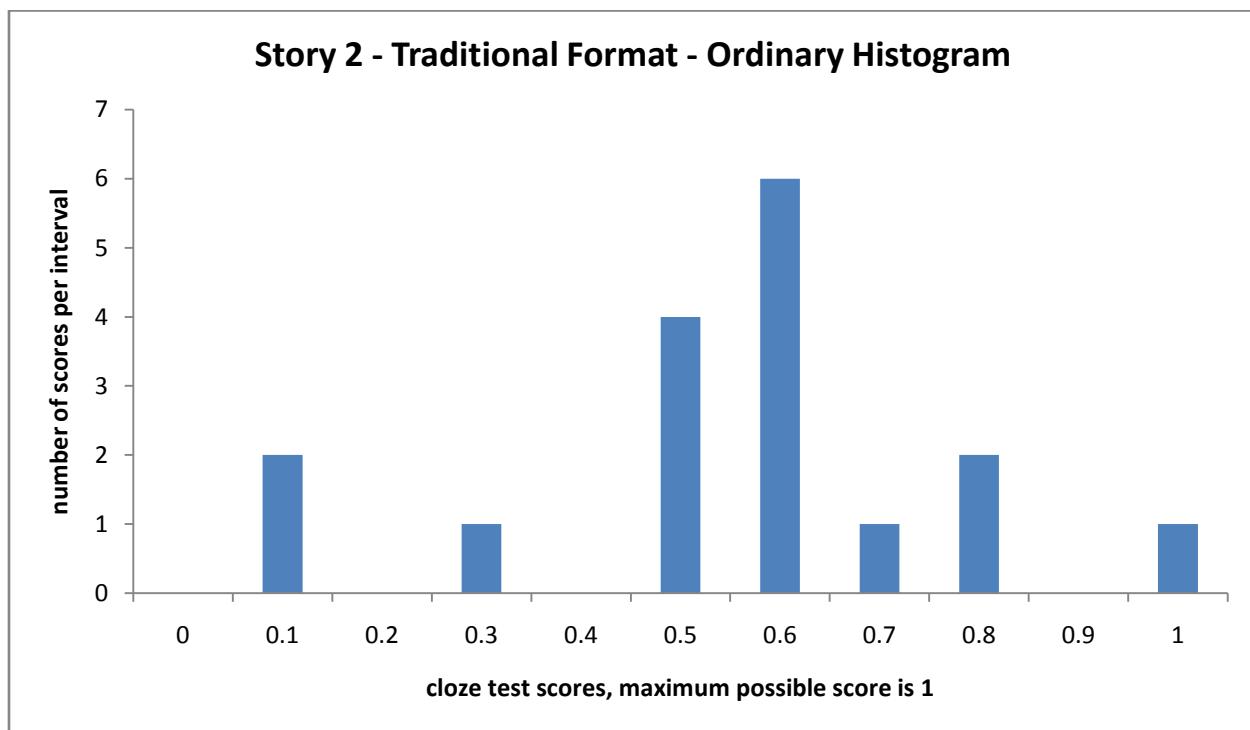
The results of the cloze test on Story 1 in traditional format are shown in Figure 3-1. A group of readers thought that this was the most difficult story because it had the most unfamiliar vocabulary. For instance, provenance, vintner, and “a plug for” are not commonly seen in everyday writing. The story was also written more as a personal conversation than a formal news article. Synonyms were rather common in the subject’s responses. Subjects in general found the topic of the story, wines, somewhat unfamiliar. There were 52 blanks in this cloze test.

Figure -- Histogram, traditional paragraph, Story 1 cloze scores in intervals of 10%



Story 2, traditional paragraph, results are illustrated in Figure 3-2. Readers in general found this story interesting, though not the easiest. The subject of the story was architecture and generally there was not as much difficulty with the vocabulary as there were in Story 1. However, there seemed to be more difficulty with prepositions. Synonyms like “art” for “architecture” were often used. There were 63 blanks in this cloze test.

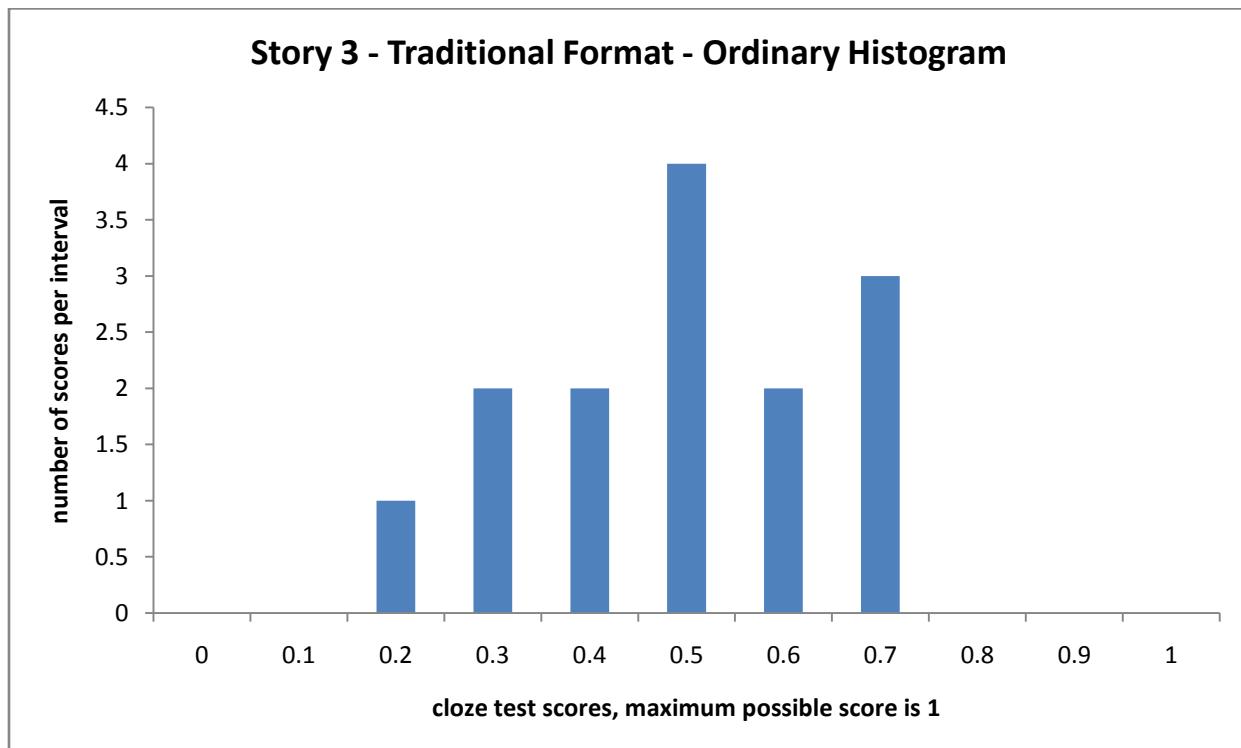
Figure - - Histogram, traditional paragraph, Story 2 cloze scores in intervals of 10%



Based on informal debriefings, Story 3 was the easiest for subjects, though not the most interesting. Perhaps because the news reported was more than 20 years old. The histogram results are shown in Figure 3-3. The most synonyms came from “Columbia’s most _____ drug dealers” with synonyms like notorious, dangerous, lethal, powerful, etc. The term “eke out a living” was not understood by some respondents and they relayed this to the researcher

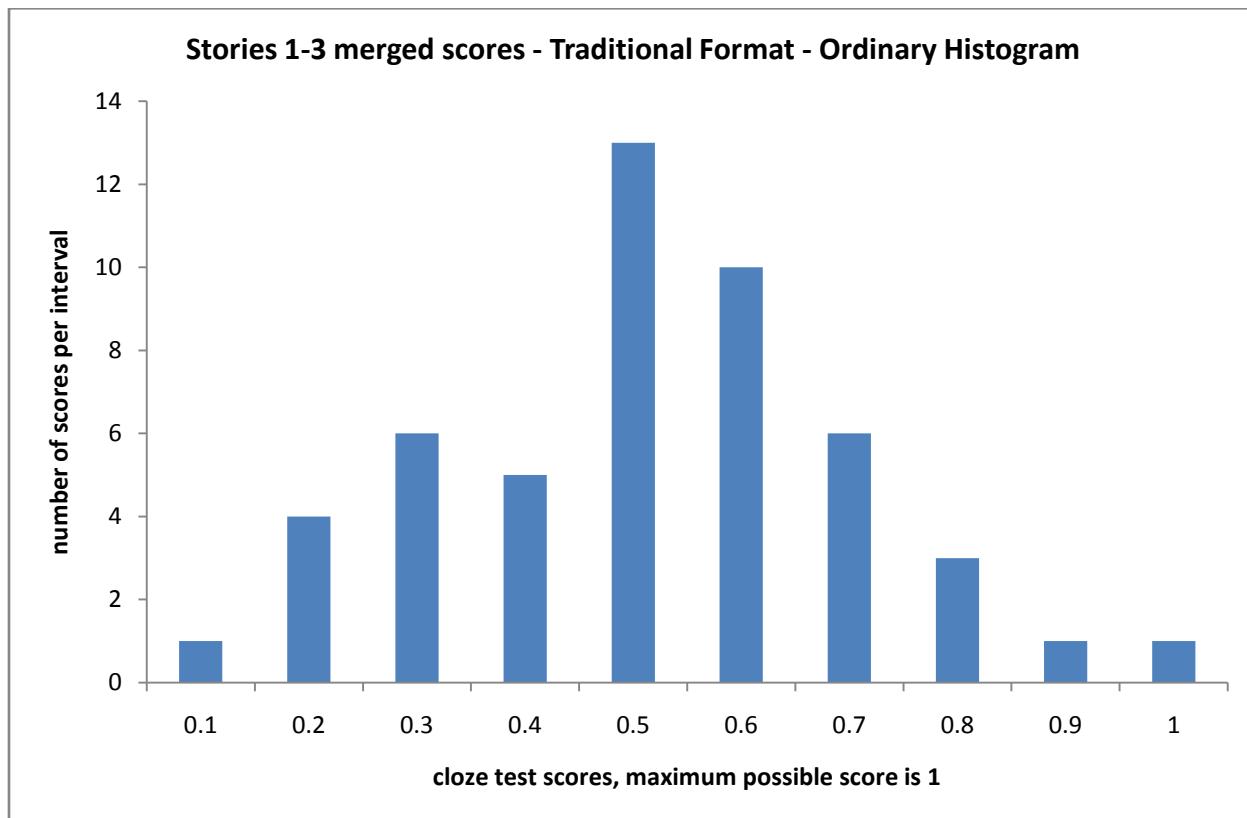
accordingly. This story was the easiest to convert to the new paragraph format. There were 52 blanks in this cloze test.

Figure - - Histogram, traditional paragraph, Story 3 cloze scores in intervals of 10%



All scores combined for the traditional paragraph are shown in Figure 3-4. The scores overall roughly correspond with what subjects had to say about the traditional paragraph in informal debriefings. Roughly that is, with respect to the fact that a few participants who said the traditional paragraph was easier did not score as well compared to the new paragraph and vice versa.

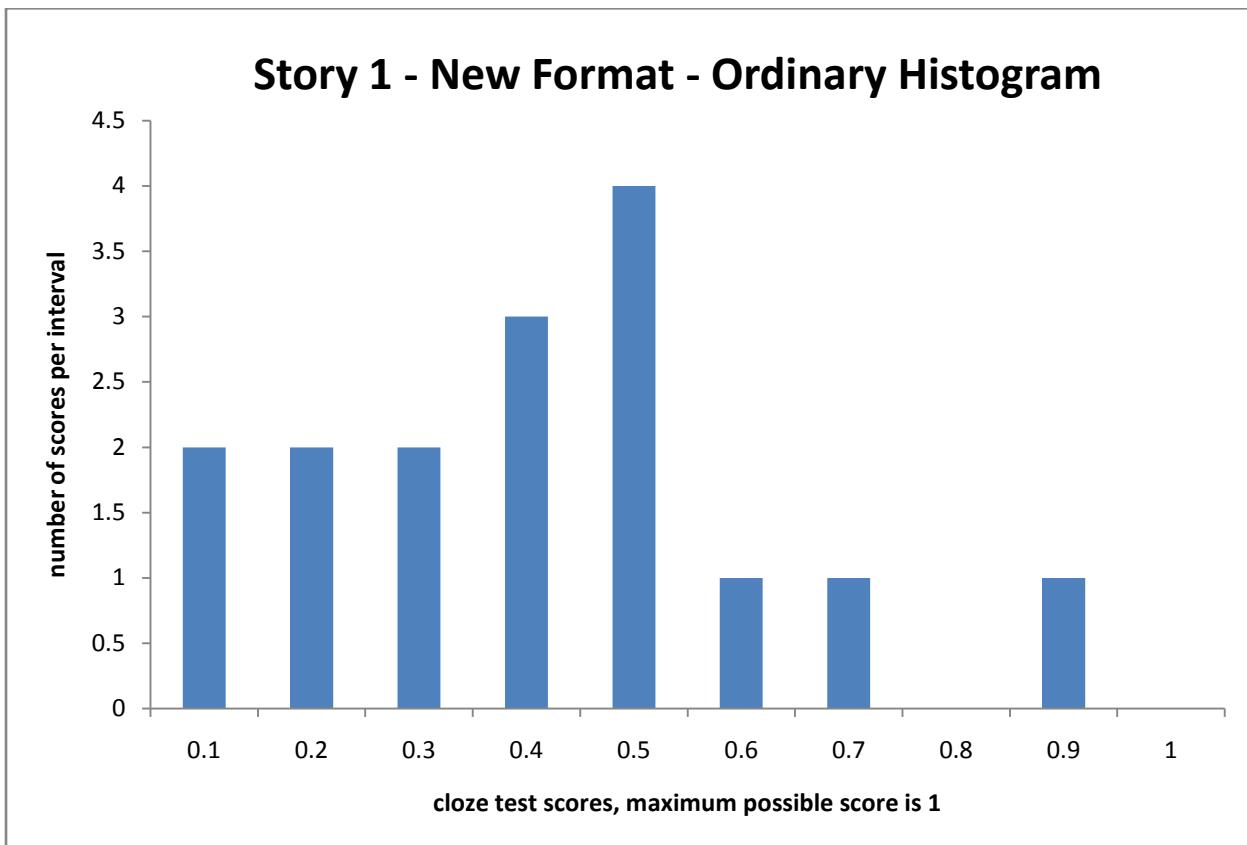
Figure - – Histogram traditional paragraph, merged cloze test scores for stories 1-3 in intervals of 10%



3.8.2. Cloze Results for the New Paragraph

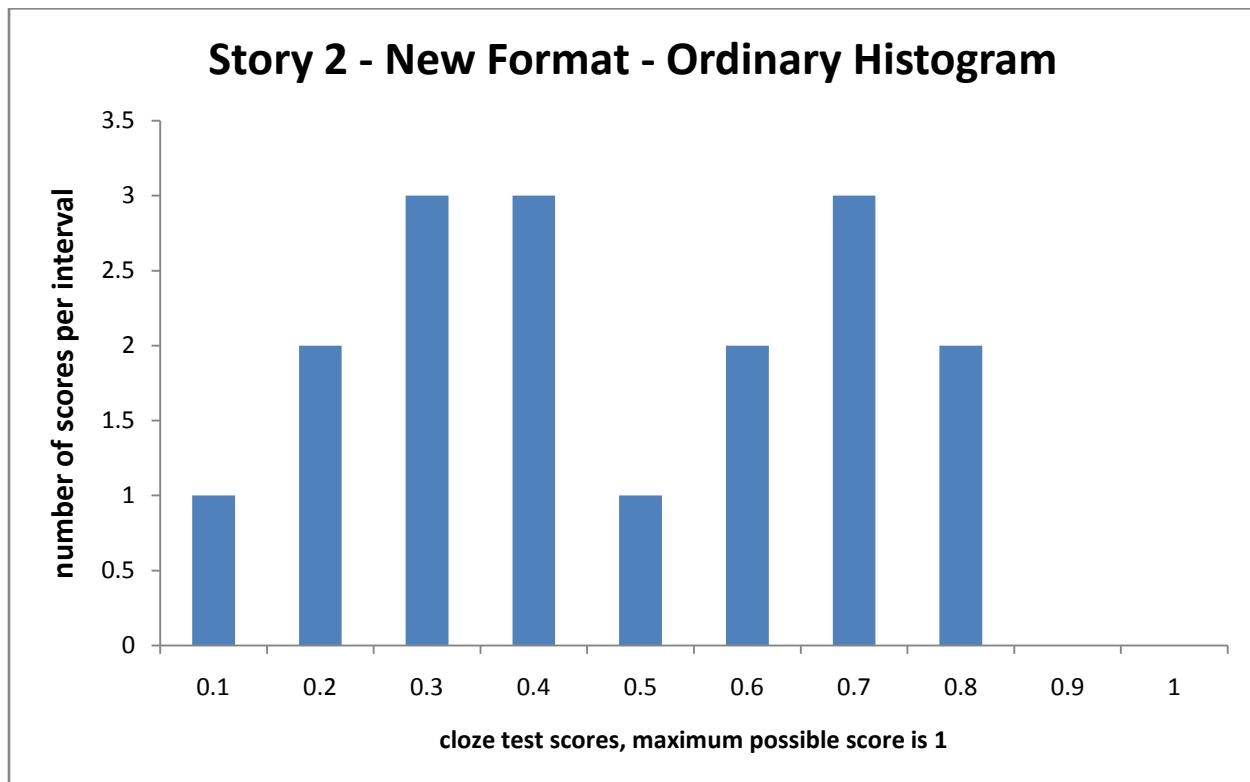
Story results for Story 1, new paragraph, are shown in Figure 3-5. Some respondents found it hard as they said that the traditional paragraph provided more context in the beginning which allowed them to fill in the blanks easier later on. Story 1 is basically a conversational style, and in converting it to the new paragraph, it may be that some of its interest value is lost going from its original “conversation” style to the new paragraph style because of the frequent pauses in “conversation” aka breaks between the paragraphs. Still, converting this story to the new paragraph was not difficult. None of the subjects expressed an overt interest in wines, so the subject material may not have been pragmatic from their viewpoint.

Figure - – Histogram, New paragraph, Story 1 cloze scores in intervals of 10%



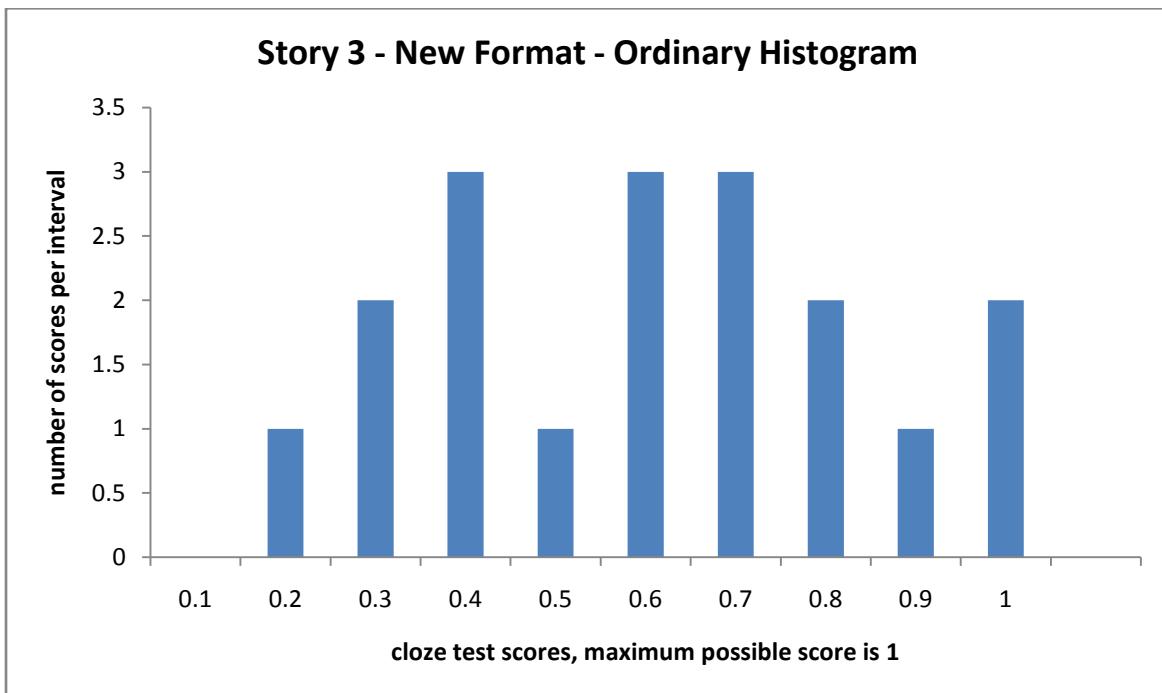
Cloze test results for Story 2, new paragraph are shown in Figure 3-6. The researcher attempted all cloze tests by himself solely to see how he would score. In this case, the test appeared easy at first glance (e.g. lots of white space, easy to scan) but the score on his test did not vary significantly from his score on the traditional equivalent. This story was the second easiest to convert into the new format, after Story 3.

Figure - - Histogram, New paragraph, Story 2 cloze scores in intervals of 10%



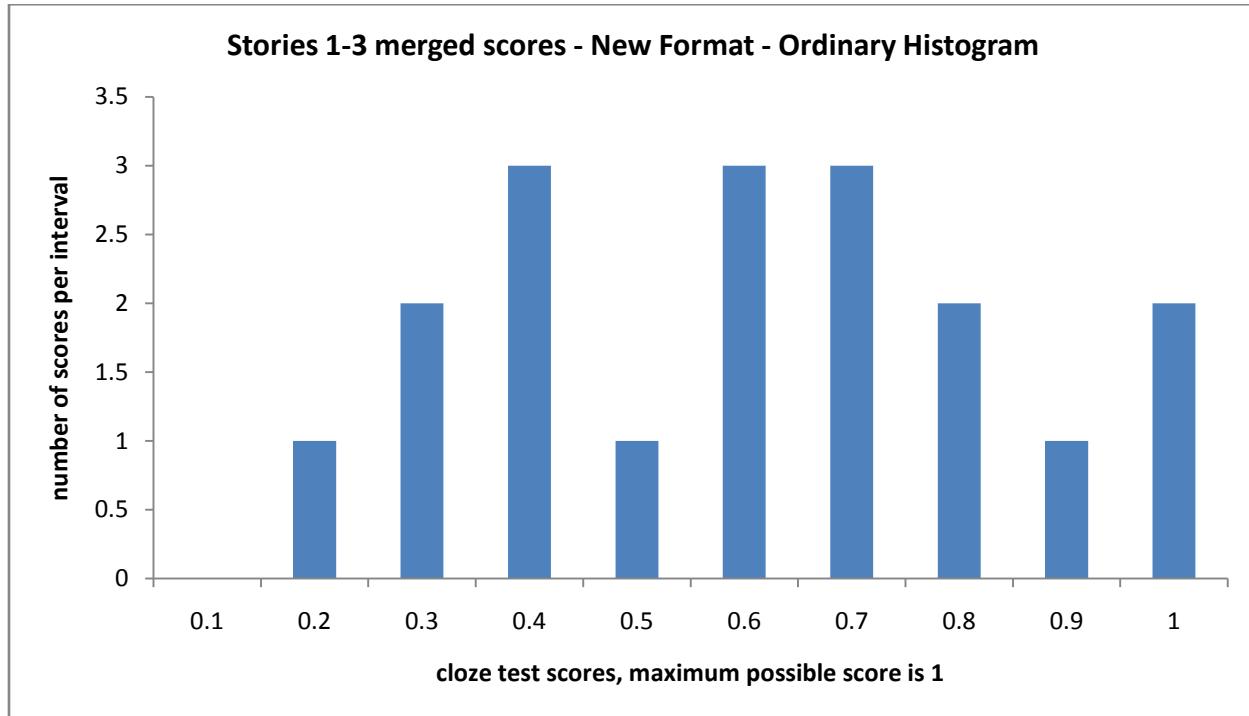
Story 3, new paragraph, scored the highest number of complete tests more than any other test although nothing statistically significant from the others. In converting this story from the traditional format to the new format, the pace of the story seemed to alter. It was as if a fast paced news bulletin was slowed to a pace more like simply stating facts. However none of the subjects made mention of this during their debriefing. The results are displayed in histogram format in Figure 3-7.

Figure -- Histogram, New paragraph, Story 3 cloze scores in intervals of 10%



A histogram of all scores for the new paragraph is shown in Figure 3-8. Overall, the new paragraph was slightly more favoured in debriefings than the traditional paragraph. Some subjects reported that they were used to this style, it was easier to get through, and that it was easier for non-English speakers to follow. Points in favour of the traditional paragraph include: we were educated using this format, it has more content in the beginning, it's closer to what we use in our native language.

Figure - – Histogram, New paragraph, merged cloze test scores for stories 1-3 in intervals of 10%



3.8.3. T-test Results

T-tests with two tails and unknown variance were conducted. The results of the t-tests of the traditional versus new paragraph are shown below in Table 2.

Table - T-tests for traditional paragraph versus new paragraph with p-value =0.05, two tails, and unknown variance

	<u>T-test</u>
	<u>score</u>
Story 1	0.20
Story 2	0.24
Story 3	0.26
Stories 1-3 merged	0.11

Using the p-value of 0.05, a generally accepted value for the t-test, there is no significant statistical difference between the readability of traditional paragraph and the new paragraph.

4. Numerically Objectifying the New Paragraph

4.1. Introduction

In this chapter the researcher will discuss how the new paragraph was numerically objectified. The intended audience is software engineers. The steps taken to numerically objectify the new paragraph were not deterministic and the organization of this chapter reflects that exactly.

4.2. Recap of the Circumstances So Far

From our reading test, the researcher found no significant difference in readability between the new and traditional paragraph. Of course, in order to compare them it was necessary to provide a definition for the new paragraph which is the focus of this chapter. This chapter will explore metrics such as the Gunning-Fog Index (Gunning, 1969) and the highly inter-correlated Flesch readability scale (Farr, Jenkins, & Paterson, 1951) to search for impacts and consequences of the new paragraph.

In Chapter One, the researcher explained that no definition for the new paragraph is available; the best that can be obtained is a description. Before readability can be measured, the new paragraph must be measured.

4.3. Making Decisions about The New Paragraph

Measurement and analysis of the new paragraph cannot proceed without making decisions. Since paragraphs are written and read by humans, who will provide paragraphs for this study?

How does one obtain them? How many does one choose? How does one measure the paragraph?

And how does one analyze it? Where are humans involved in the readability process?

And here lies the problem. Areas in Computer Science where human involvement is the norm are generally highly complex and challenging for investigators to study. They require much larger numbers of decisions, trade-offs, and approximations to produce concrete outputs (Singh & Miller, 2010). Numerically objectifying the new paragraph will also involve large numbers of decisions, trade-offs, and approximations.

4.4. Journalism and The New Paragraph

Consider this question: who will provide new paragraph material? Journalism maintains a

number of attributes that make it different from other information gathering practitioners such as counsellors, copy writers, or investment advisors. Information is approached with acknowledgement to sources, fairness, correctness, applicability to the audience, and newness.

Newness is of interest to this study since stories must possess new information and not just headline news. Properly practiced, Journalism has toppled presidents, uncovered corruption in government and corporations, and warned society of dangerous products such as automobiles and medicines. Indeed, a working democracy requires its members to be informed of daily relevant issues (Foust, 2009).

In short, Journalism reaches a targeted reading audience with a lot of credibility in hand. Starting with this approach, the first step is to determine what organizations establish the credibility of individual newspapers. The Audit Bureau of Circulations (ABC) was established in 1931 to provide concise, autonomous, and comparable circulation data to assist in the purchasing of advertising space. At that time, it was calculated that if national newspaper circulation

numbers were to be believed, then every man, woman, and child would have to purchase seven daily newspapers a day (Hawkins, 1997). Further circulation information was obtained from the World Association of Newspapers (WAN) which also provides circulation data for comparison. (Anonymous5, 2010). Together, this researcher used them to compile a list of the top 43 daily English language newspapers in the world. According to the definition of a daily newspaper, a newspaper is considered a daily if it is published at least four times a week. Table 3 lists the daily newspapers used in this study (Djankov, 2001).

Table - Top 43 English Language Dailies in the World

Rank	Newspaper Title	Country
1	The_Times_of_India	India
2	The_Sun	UK
3	Daily_Mail	UK
4	USA_Today	US
5	The_Hindu	India
6	Deccan_Chronicle	India
7	Daily_Mirror	UK
8	New_York_Times	US
9	Daily_Star	UK
10	Daily_Telegraph	UK
11	Daily_Express	UK
12	The_Economic_Times	India
13	Los_Angeles_Times	US
14	Washington_Post	US
15	Daily_News	US
16	New_York_Post	US
17	Chicago_Tribune	US
18	The_Times	UK
19	Houston_Chronicle	US
20	The_Telegraph	India
21	Herald_Sun	Australia
22	Arizona_Public	US
23	DNA	India
24	The_Daily_Telegraph	Australia

25	Financial_Times	UK
26	Philadelphia_Daily_News	US
27	Newsday	US
28	The_Denver_Post	US
29	Daily_Record	UK
30	The_Globe_and_Mail	Canada
31	Toronto_Star	Canada
32	The_New_Indian_Express	India
33	The_Guardian	UK
34	Star_Tribune	US
35	St._Petersburg_Times	US
36	Chicago_Sun-Times	US
37	Plain_Dealer	US
38	The_Oregonian	US
39	Seattle_Times	US
40	Dallas_Morning_News	US
41	Detroit_Free_Press	US
42	San_Diego_Union-Tribune	US
43	San_Francisco_Chronicle	US

4.5. The Logistics of Collecting Top Newspaper Stories

The next task was to collect the top story from each daily newspaper's online edition. A newspaper's very survival depends upon the editor's ability to choose a top story for the daily that will attract maximum readership. For this reason, the top story was chosen to be the most widely read story in an online newspaper daily's edition. Interestingly, the top story of a national newspaper such as The New York Times is not necessarily the same as say the San Francisco Chronicle, where municipal events are front page stories. At what time of day to collect the stories was another issue to address. Since the daily newspapers are located in various time zones of the world, it was decided to wait at least 24 hours between collections in order for the daily newspapers to publish fresh editions and not simply update their front pages with "Latest Breaking News" additions.

While the top story is apparent in the print edition, determining the top story in an online daily is not always obvious. For example, The Sun in the UK has several stories on its front page, all contending for the top story. Several dailies rotate their top story photo and headline as the reader views the page. So it became necessary to know the current events of newspaper's home region (e.g. UK, Australia) in order to select the newspaper's top story every time. For instance, reading several dailies from the UK allows one to choose the top daily story from the online edition of The Sun. Likewise, in the case of a revolving headline, the newspaper's top story could be determined.

The actual collection of the top story presents its own set of challenges. A number of major newspapers embed advertising in their body text, making it necessary to skim the article to determine which parts to extract. In addition, hidden characters are often embedded in the body text making it necessary to review the contents of the pasted text for abnormalities. As one familiarized themselves with online dailies, they acquaint themselves with the nuances of how dailies typeset their text for the web. In doing so, one learns to avoid certain pitfalls with certain papers.

Avoiding JPEG images imbedded in the text requires special care, as they can be linked closely to the previous word of text and their HTML anchors copied inadvertently. There is no real solution to this issue; it is a matter of experience and judgement. Also, not every story title is text, some are JPEG images and others are broken over several lines. Again, it was a matter of experience and judgement. Every region uses its own unique English idioms and vocabulary, many of which cannot be found in the Oxford English dictionary. This was dealt with by networking with natives of the regions to determine the nuances of their native writing style.

One issue encountered during the collection of data was the insertion of malicious JavaScript into the browser by the daily newspaper's online edition. This blocked the collection of data. The problem was resolved by installing Ghostery (Ghostery, 2010) and Adblock (Adblock-Plus, 2010) plus into the browser to circumvent the malicious code.

4.6. The Analysis of The New Paragraph

4.6.1. Overview

Twelve hundred stories were collected and read over a period of four months from the top 43 English language daily newspapers. Corsair, a system developed by the researcher, then read the stories. An overview of the measures produced by Corsair is given in Table 4.

Table - Corsair results

<u>Number</u>	<u>Metric</u>
1	Newspaper Name
2	Story Title
3	Story paragraph Count
4	Number of Sentences per Story
4	Page
5	Story Page Word Count
6	Number of Characters per Story
6	Page
7	Average Words per Sentence
8	Average Syllables per Word
9	Lines of Whitespace in a Story
10	Flesch Reading Ease Score
11	Flesh-Kincaid Grade Level
12	Gunning-Fog Index

Some things omitted from the table include date and time collected, items needed only for data collection purposes. Each story has a paragraph count. The number of sentences in each story is also included. The number of words and characters in each story is included also. A count of the lines of whitespace in a story is maintained. The average words per sentence and words per syllable are counted. Finally, three readability metrics are calculated for each story: Flesch Read Ease Score (Farr, et al., 1951), Flesch-Kincaid grade level (Meyer, 2009), and the Gunning-Fog (Gunning, 1969) reading index.

For the purposes of scientific rigor, story pages were analyzed using different components wherever possible. As the different components often result in different answers. This is summarized in Table 5.

Table -Corsair Components

<u>Story Page</u>	<u>Corsair</u>	<u>Unix 'wc'</u>	<u>Flesh</u>	<u>Lingua</u>
characters	C	x		x
word count	C	x	x	
sentences			C	x
paragraphs	C	x		x
lines of empty space	x			
average words per sentence			C	x
average syllables per word			C	x
Flesch reading ease score			C	x
Flesch-Kincaid grade level			C	x
Gunning-Fog Index				C

UNIX ‘wc’ refers to the UNIX utility ‘wc’ (Kernighan & Pike, 1984). Flesh (Flesh, 2007) (note the spelling difference between Flesh and Flesch) and Lingua (Lingua, 2010) are both external components. A ‘C’ indicates the chosen source.

Choosing a data source was not easy because in most cases the data from each component was close. In those cases where the data was identical, no choice was needed. In other cases where two out of three results were identical, the duplicated results were considered to be more valid. In the case where no results were identical, selection was made as follows: first the standard deviations were computed and lower one given more weight. Second, the number of outliers was calculated and the lower value weighted more. Third, the cross platform compatibility of the component was taken into account as this is a factor in of reproducibility the results. The three factors together made it decisive as to which component’s output to select.

The mean, standard deviation and median for each of the ten metrics is shown in Table 6.

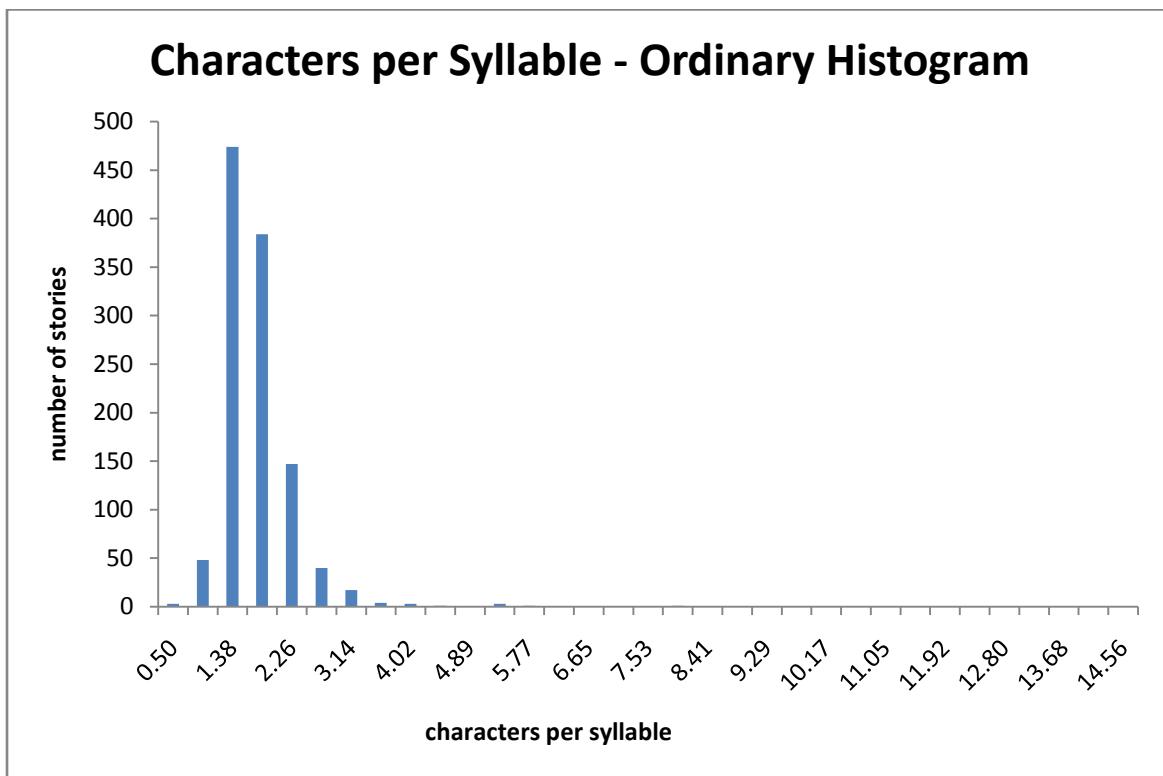
Table - Ten metrics generated by Corsair

<u>No.</u>	<u>Metric (story Page)</u>	<u>Average</u>	<u>Std Dev</u>	<u>Median</u>
1	Characters/Syllable	3.83	0.30	3.81
2	Characters/Word	6.02	0.26	6.02
3	Syllables/Word	1.58	0.11	1.58
4	Words/Sentence	21.46	4.70	20.85
5	Words/Paragraph	34.59	16.55	32.26
6	Sentences/Paragraph	1.52	0.67	1.42
7	Paragraphs	18.28	11.86	16.00
8	Flesch Reading Ease Score	51.43	11.29	51.30
9	Flesch Kincaid Grade Level	11.42	2.50	11.45
10	Gunning-Fog Index	14.22	3.15	14.14

4.6.2. The Number of Characters per Syllable in each Story Page

A histogram of the number of characters per syllable is shown in Figure 4-1.

Figure - – Corsair results, Ordinary Histogram of Characters per Syllable

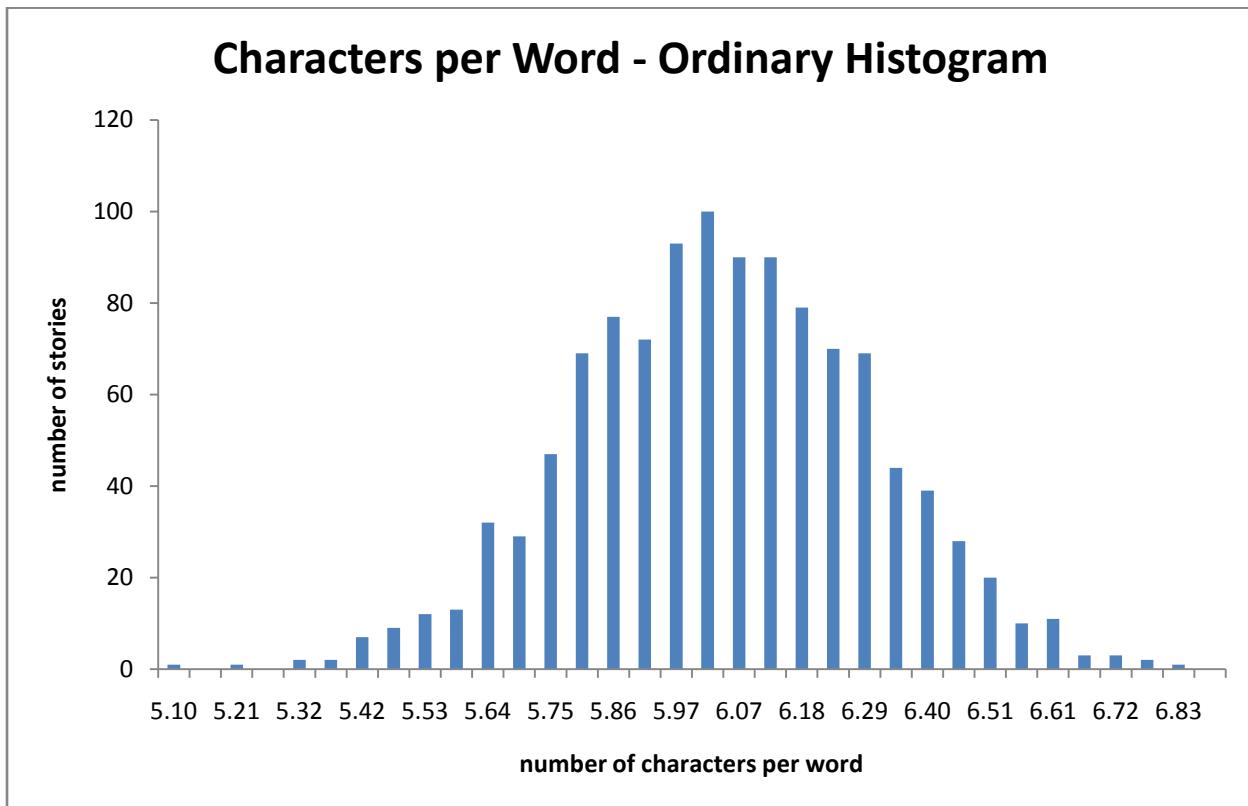


The amount of text and ergo the number of characters generated for an online daily story page is completely at the discretion of the publishing newspaper. Computing the number of characters per syllables is more straightforward. The character counts from Corsair, UNIX ‘wc’, and Lingua were the same. Corsair was selected.

4.6.3. The Number of Characters per Word in each Story Page

A histogram of the number of characters per syllable is shown in Figure 4-2.

Figure - - Corsair results, Ordinary Histogram of Characters per Word



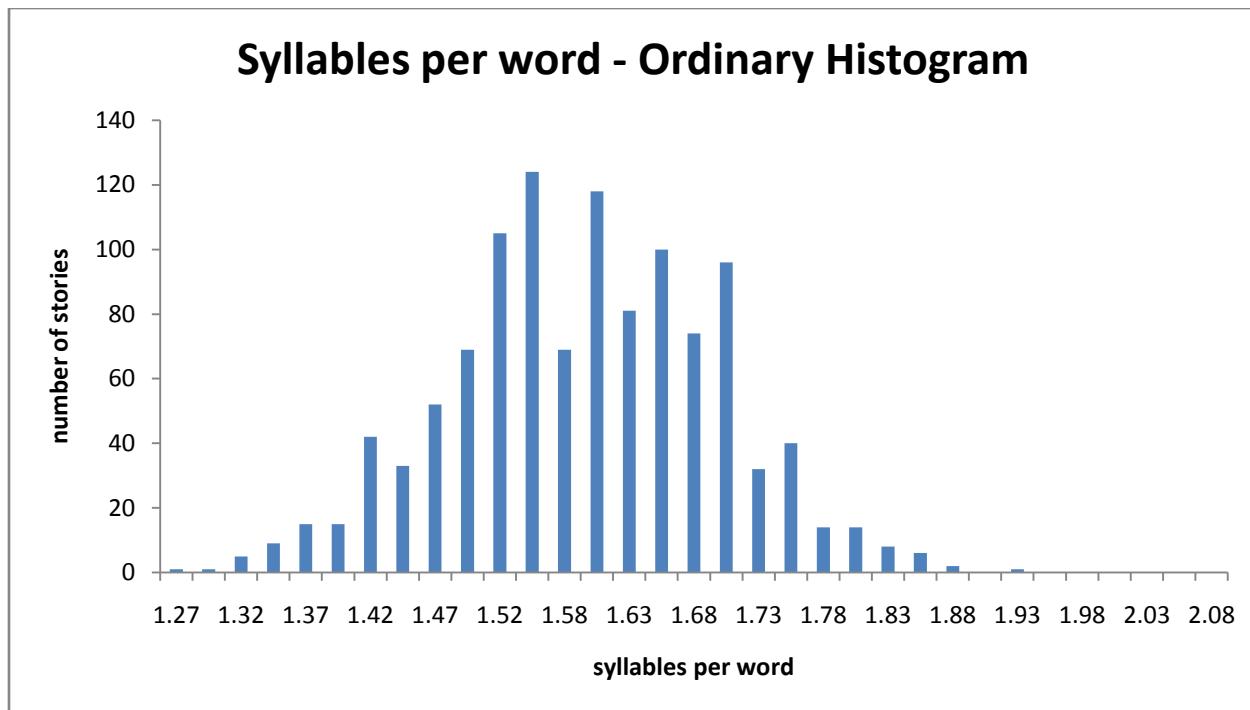
Corsair and Unix ‘wc’ produced identical counts for both characters and word. Corsair defines a word as any series of characters separated by any combination of blank spaces or tab spaces. What constitutes a word in a story is subjective. Do numbers constitute a word? What about abbreviations? Roman numerals? Clearly there are many definitions possible.

Corsair was selected the preferred component for this metric.

4.6.4. The Number of Syllables per Word in each Story Page

The average number of syllables per word per story is shown below in Figure 4-3.

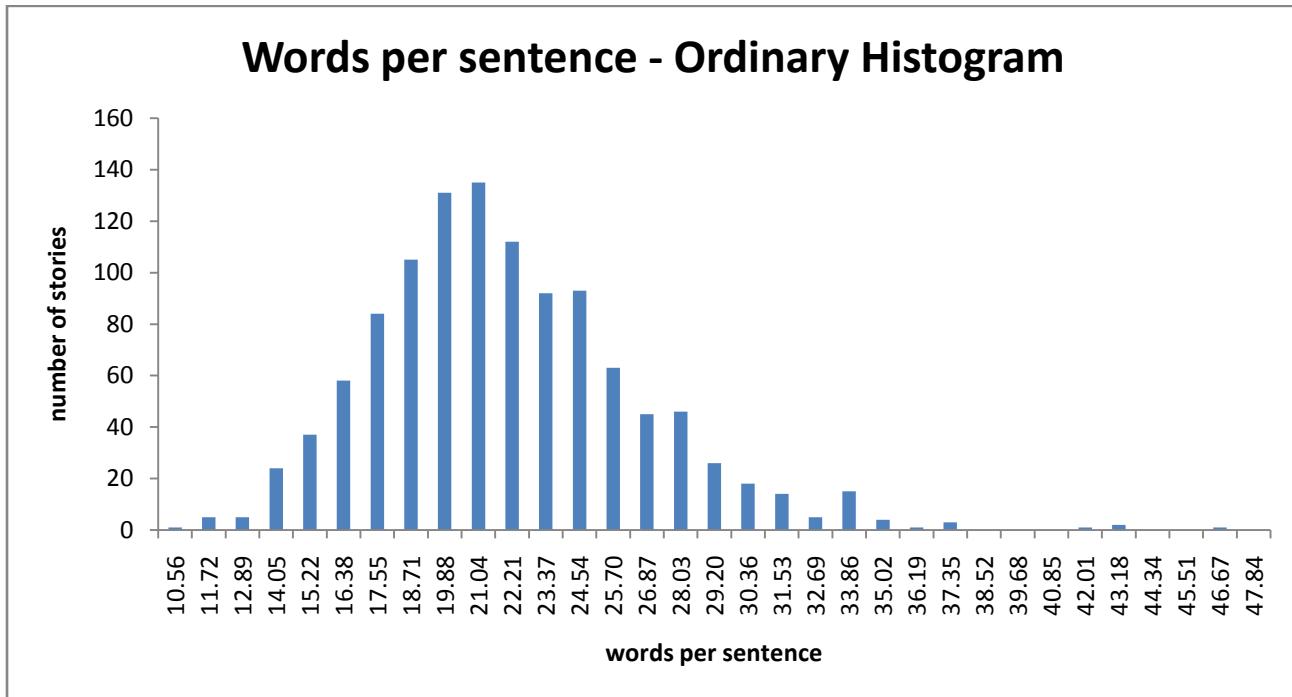
Figure - – Corsair results, Ordinary Histogram of syllables per word



Computing the number of syllables per word is not straightforward. Not only are there a number of heuristics involved in syllable counts, what constitutes a syllable is open to definition. For example, is '1984' one syllable, 3 syllables (quote 1984 quote), or 5 syllables (NINE-TEEN-EIGHT-TEE-FOUR)? So it is not a surprise that the syllable counts differ between Lingua and Flesh. Flesh was chosen as the preferred component for this metric.

4.6.5. The Number of Words per Sentence in each Story Page

Figure - – Corsair results, Ordinary Histogram of Words per Sentence



The number of words per story sentence is shown in Figure 4-4. Lingua and Flesh produce different but close sentence counts. There are a number of reasons for the differences between Lingua and Flesh. The main reason is that it is difficult to define what constitutes a sentence. Consider the sentence “He went home to B.C. Afterwards, he retired.” If one is counting periods as the end of a sentence then how does one contend with a sentence that ends with an abbreviation? One might be tempted to say that an abbreviation followed by a capital letter signifies the end of a sentence. However, this idea will not work for sentences such as “The letter went to Mr. Smith and he threw it away.” In addition, when one considers that newspapers

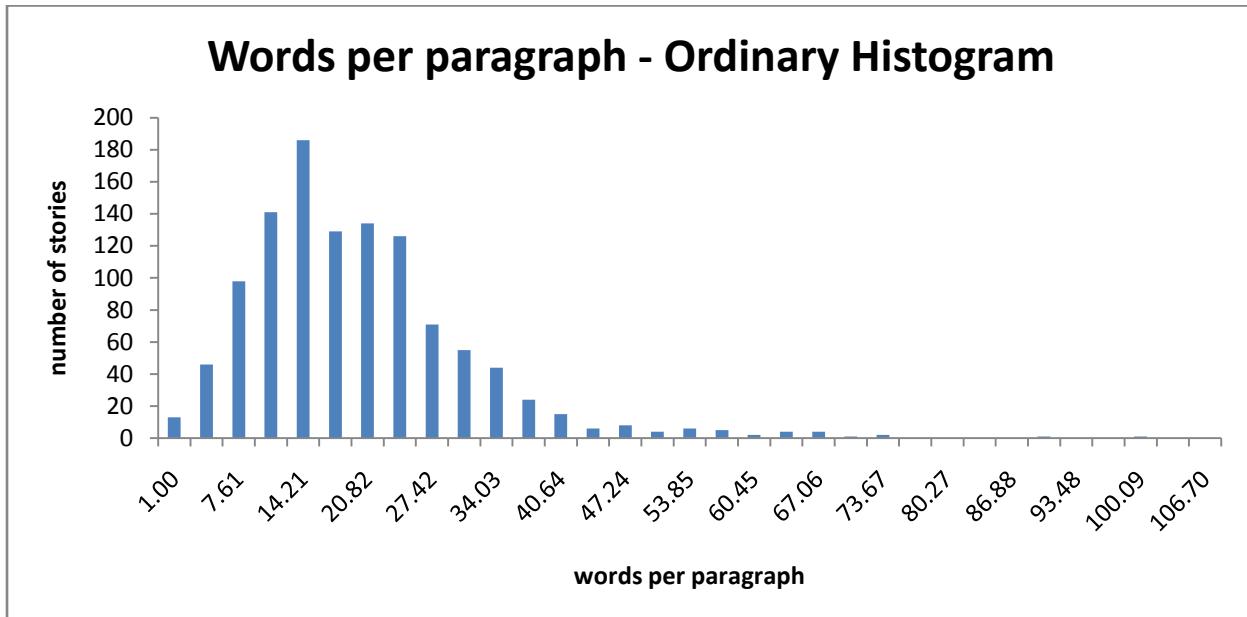
change the language and style they use to appease their readership daily without consulting other newspapers as to the rules of English grammar, one can see that there are no easy answers.

Fortunately, for most sentences simple rules are enough to determine their day to day structure. This was confirmed by simply reading the stories. Flesh was chosen as the preferred component for this metric.

4.6.6. The Number of Words per Paragraph in each Story Page

The number of words per paragraph is shown below in Figure 4-5.

Figure - – Corsair results, Ordinary Histogram of Words per Paragraph

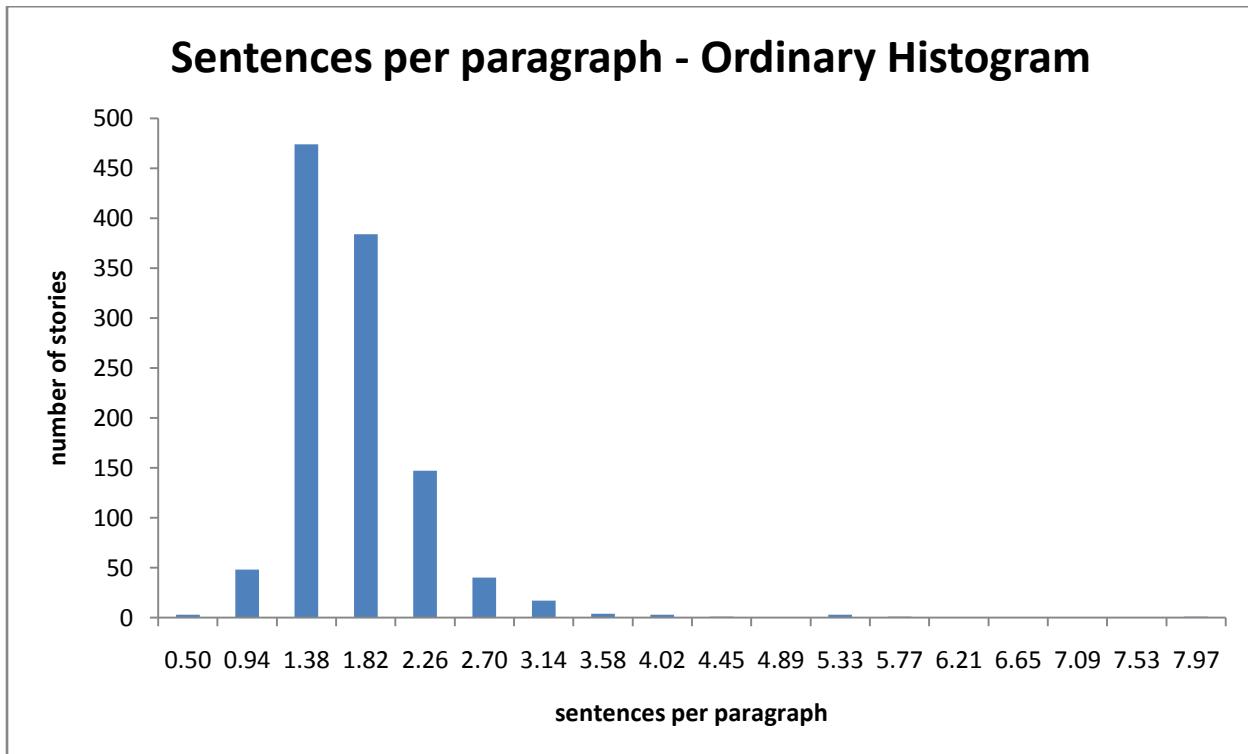


Corsair defines a paragraph as any line that contains a newline character AND is not completely composed of white space. The paragraph counts from Corsair and UNIX ‘wc’ were identical. Corsair was chosen as the preferred component for this metric.

4.6.7. The Number of Sentences per Paragraph in each Story Page

A histogram of the number of sentences per paragraph is shown in Figure 4-6.

Figure - – Corsair results, Ordinary Histogram of Sentences per Paragraph



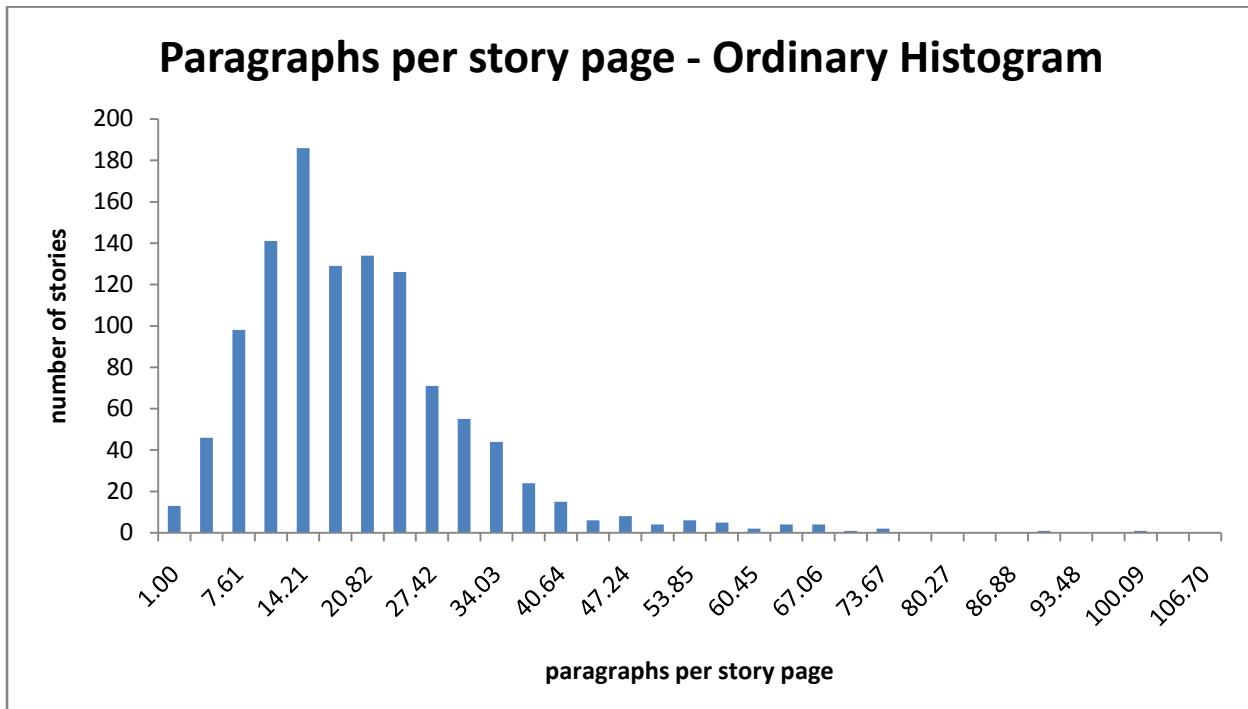
As can be seen from the histogram, the number of sentences in the new paragraph is significantly lower than the traditional paragraph. In reading more than 1200 articles, it's apparent that the new paragraph takes certain liberties with English sentence structures to appeal

to its net readers. At the same time, it is difficult to criticize the grammar used in an online daily, or a broadsheet daily for that matter as it is the editor's role to ensure that the grammar used matches its readership and not vice versa.

4.6.8. The Number of Paragraphs in each Story Page

A histogram of the number of paragraphs per story page is shown in Figure 4-7.

Figure - – Corsair results, Ordinary Histogram of Paragraphs per Story Page



The number of paragraphs per story page is of course a function of the daily newspaper's editorial strategy to appeal to readers. What constitutes an editorial strategy for success? Consider the results of an editorial study done in 1977 to answer that very same question:

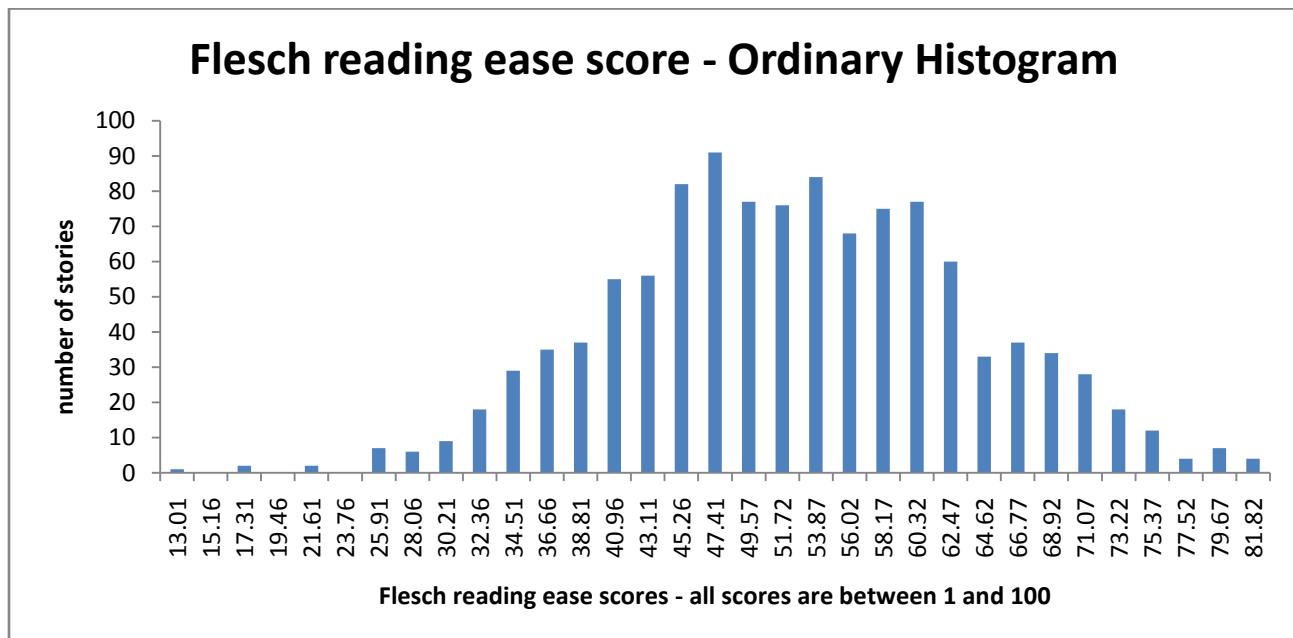
“[Bogart] surveyed editors on their definition of a quality newspaper in 1977. He compared the responses from editors of successful newspapers to those of editors whose papers were slipping, expecting to find the secret of success. But the winning editors and losing editors, to his surprise gave the same answers. Success and failure had more to do with pricing, distribution, and population changes in the cities where papers were published than with the character of the editorial mix or the operating practices or theories of individual editors.

Editors were not ready to hear this. Rather than rejoicing that the readership decline was not their fault they attacked Bogart and his conclusions.” (Meyer, 2009, p. 122)

4.6.9. The Flesch Reading Ease Score per Story Page

A histogram of the Flesch Reading Ease Scores is shown in Figure 4-8.

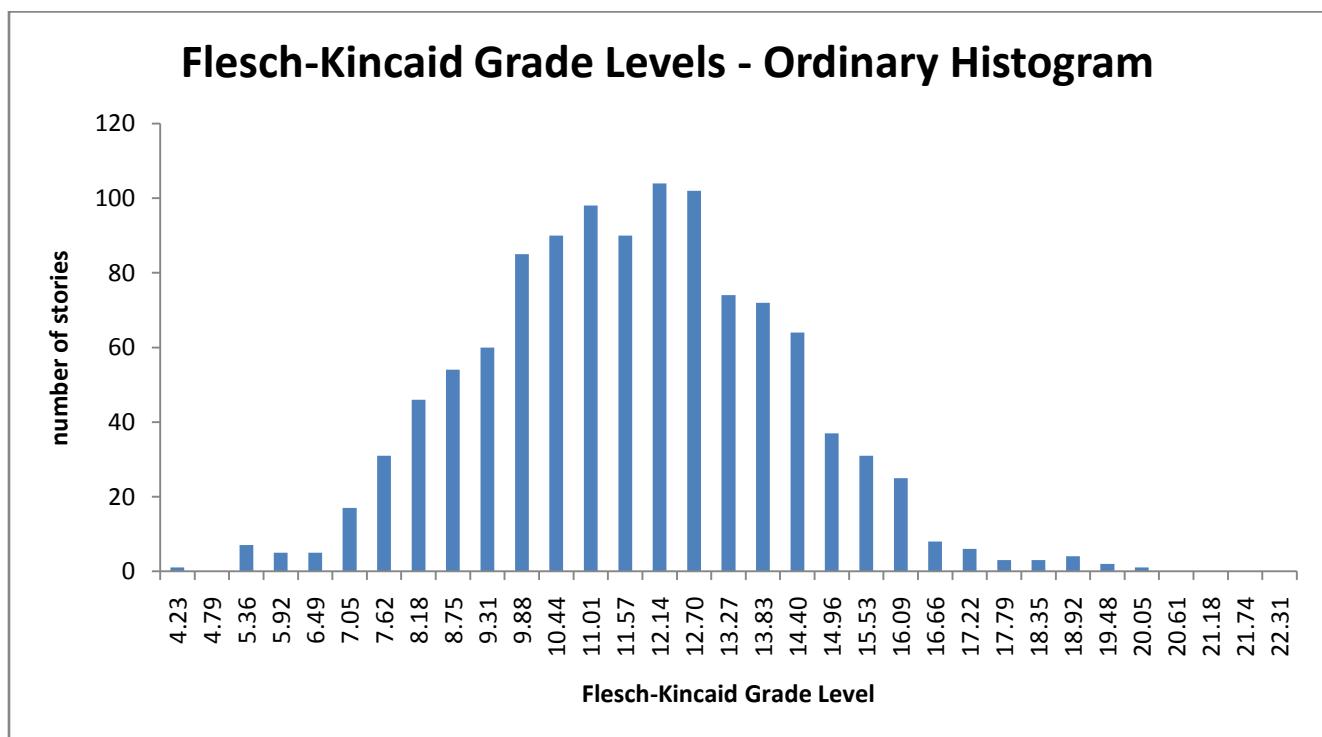
Figure - – Corsair results, Ordinary Histogram of Flesch Reading Ease Scores



The Flesch Reading Ease Score is calculated by measuring sentence length and number of syllables per 100 words. The result is a number from 0 to 100 with the higher the number, the better. Insurance laws in some US states specify that clear language is a Flesch Reading Ease Score of 40 or 50 (Redish, 2000). The Flesch Reading Ease Score was included in Corsair because it provides a determination of the reading ease of a story at a glance. The median Flesch Reading Ease Scores for Flesh and Lingua are 50.77 and 51.3 respectively.

4.6.10. The Flesch-Kincaid Grade Level per Story Page

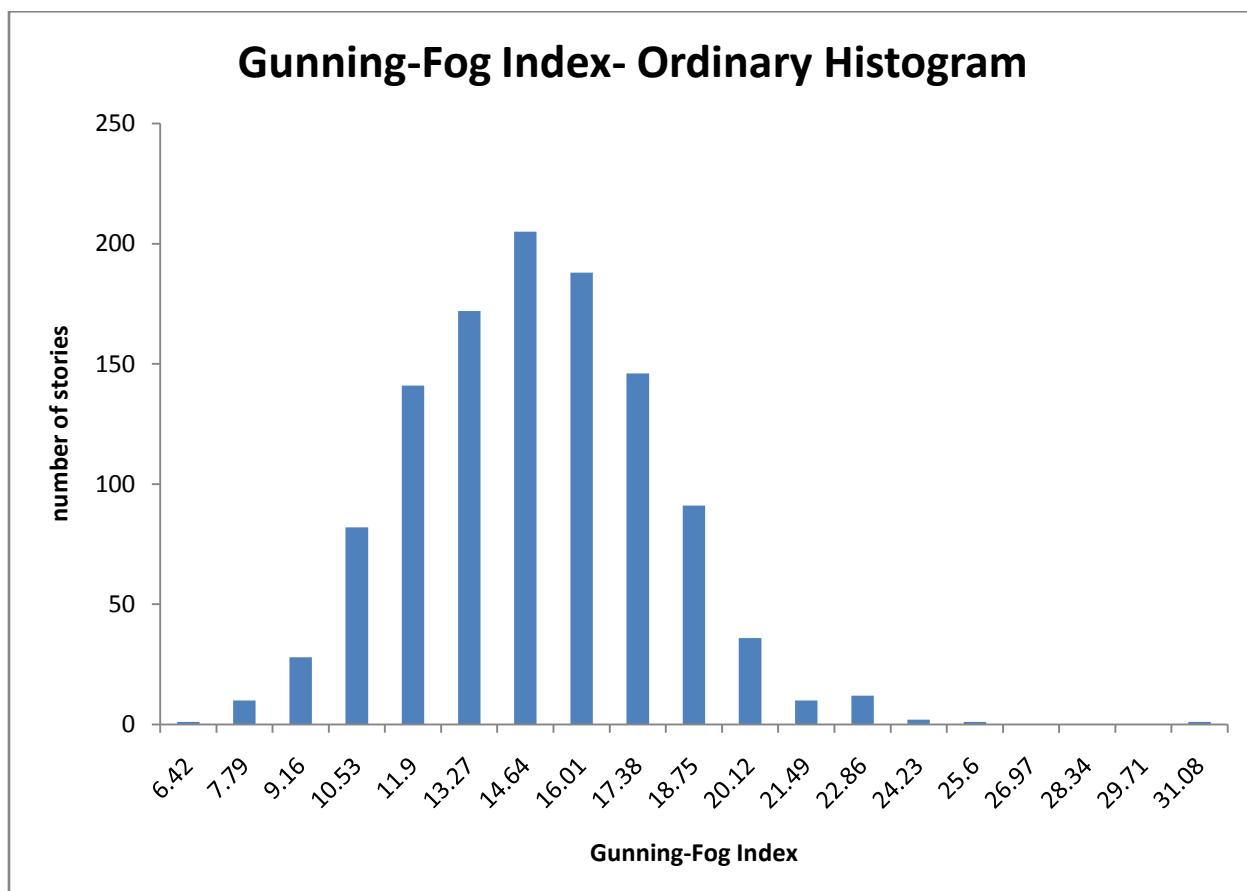
Figure - – Corsair results, Ordinary Histogram of Flesch-Kincaid Grade Levels



The Flesch-Kincaid Grade Level uses the Flesch Reading Ease Score calculate a US grade-school level. A higher grade means that it is harder to read. It is included in Corsair because its widespread use means it is easy to compare it against other metrics (Graesser, McNamara, Louwerse, & Cai, 2004). Within Lingua, there are two grade-levels that are outliers at 28.69 and 47.72. Rereading the stories associated with these grades reveals no apparent reason for their high scores.

4.6.11. The Gunning-Fog Index per Story Page

Figure - - Corsair results, Ordinary Histogram of Gunning-Fog Index



The Gunning-Fog Index is calculated using the number words of with three syllables or more and the number of words and sentences per paragraph; it measures how many years of education are needed to read a passage of text (Kruse, 2005). The selection of the Gunning-Fog index was straightforward. The Gunning-Fog index is widely used and is the index most often cited in business writing texts (Bogert, 1985). It is also the most popular option to Flesch (Meyer, 2009).

4.7. Metrics and the traditional paragraph – a sample

A sample of nine story pages was taken from the newspapers listed in the study. Most stories were published prior to 1985 and are in the traditional paragraph format. Corsair results are listed in Table 7.

Table - Corsair results, traditional paragraph

<u>No.</u>	<u>Metric (story Page)</u>	<u>Average</u>	<u>Std Dev</u>	<u>Median</u>
1	Characters/Syllable	3.96	0.37	3.89
2	Characters/Word	6.23	0.42	6.11
3	Syllables/Word	1.58	0.09	1.58
4	Words/Sentence	29.03	11.90	25.67
5	Words/Paragraph	155.81	115.27	195.00
6	Sentences/Paragraph	5.34	4.12	4.00
7	Paragraphs	3.22	2.73	1.00
8	Flesch Reading Ease Score	44.15	17.83	45.86
9	Flesch Kincaid Grade Level	14.31	5.36	14.19
10	Gunning-Fog Index	17.03	4.08	16.13

Data for each of the ten metrics, traditional and new, was used to conduct a t-test. The results are shown in Table 8.

Table - T-tests traditional versus new paragraph

<u>No.</u>	<u>Metric (story Page)</u>	
1	Characters/Syllable	0.304
2	Characters/Word	0.181
3	Syllables/Word	0.902
4	Words/Sentence	0.093
5	Words/Paragraph	0.013
6	Sentences/Paragraph	0.024
7	Paragraphs	0.000
8	Flesch Reading Ease Score	0.256
9	Flesch Kincaid Grade Level	0.144
10	Gunning-Fog Index	0.073

The results are interesting. Using the p-value of 0.05, words per paragraph, sentences per paragraph, and paragraphs all show significance.

In a global sense, a conclusion that could be drawn from the results is that the new paragraph differs significantly in the number of words per paragraph and sentences per paragraph. All the values taken together as a whole give a picture of the new paragraph as being different from the traditional paragraph in length only. The readability scores, the word size and the sentence length do not differ significantly between the two. The number of paragraphs per story is significant but the number of paragraphs put into a web story page is entirely at the discretion of the news publishing organization.

4.8. Summary

Before any readability of the new paragraph begin, it is necessary to be able to measure and express it in numbers. Journalism was selected as the source for the new paragraph as it is used exclusively in this study. Journalism reaches its readers with a lot of credibility in hand, including circulation numbers. The logistics of collecting the new paragraph was discussed as well as guiding principles on how to build a system to do so. The results of the collection discussed and histograms provided for each metric. Lastly, T-tests are conducted for the traditional paragraph metrics versus the new paragraph metrics and significances were discussed.

5. Concluding Thoughts

Investigating a topic that no one has ever researched before presented itself with its own set of challenges, none of which were insurmountable so long as the correct approach was selected from the beginning. The new paragraph represents a fundamental change in the way we write; the conclusion of this thesis is that the new paragraph has no effect on readability. To arrive at this conclusion first the researcher examined human reading physiology, described the new paragraph, explored readability measurement possibilities, and conducted a literature search.

Next the researcher provided a narrative of how he arrived at the point of defining the new paragraph. From its birthplace in The New York Times, the researcher examined amongst other things Journalism, readability scores, and the style and form of the new paragraph. Both Software Engineering and Journalism deal with wicked problems. First formulated by H. Rittel in 1973, he states that science is bound to fail when dealing with social problems because science is set up to deal with “tame” problems as opposed to “wicked” problems. Amongst other things, wicked problems have no stopping conditions, no trial-and-error learning opportunities, and every wicked problem can be thought of as the symptom of another problem (Rittel & Webber, 1973). Readability, profitability and integrity are but a few wicked problems common to both Software Engineering and Journalism.

Defining the new paragraph in Software Engineering was a wicked problem. The Corsair system was developed with wicked problems in mind. Corsair could have been approached from a Computer Science viewpoint; however, Software Engineering provides more reliability in the scope of wicked problems. Not to say that Software Engineering is the optimal approach or that one even exists; it was, however, the optimal approach in this situation. And wicked problems

are all about dealing with problems in a case by case situation as opposed to tackling with them with dogmatic broad strokes.

In this regard, a reading test seemed to be the best way to test the readability of the new paragraph as opposed to using extensive software analysis. The cloze test was selected which is considered the most reliable metric of readability and also the most expensive. Fifty four subjects participated in a reading test to determine whether the new paragraph is more readable than the new paragraph. The results showed that there is no difference in readability between the old and new paragraph.

Future directions of this research are quite intriguing. Training artificial intelligence algorithms with the data sets is one possibility. The outcome of this would be predictive metrics that are academically significant and valid, but in what ways could they provide reliable metrics for everyday use? This in itself is a fundamental wicked problem in Software Engineering. However, the reader is cautioned to not jump to conclusions; wicked problems have always existed and any intimidation factor they have can be mitigated with the use of proper Software Engineering practices.

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1. Appendix A - A Bargain Hunter's Best Friend (Traditional, Story 1)

_____ (1) only yesterday that the wine _____ (2) were filled with snapshots
_____ (3) smirking winemakers announcing that their _____ (4) vintage, all three
barrels of it, _____ (5) go for a \$300 bottle. _____ (6) didn't even have the
_____ (7) to blush. Of course, why _____ (8) when packs of instant connoisseurs—
many _____ (9) them dot-commers, bankers, and businessmen of uncertain
_____ (10) — were elbowing one _____ (11) aside, waving fistfuls of green?

They _____ (12) still out there, the _____ (13) vintners and their gullible fans, but
their _____ (14) are numbered. We're all _____ (15) to need the dough
_____ (16) gasoline.

All of which makes Arthur Damond _____ (17). For nearly 27 years, he _____ (18)
been publisher, editor, wine _____ (19), bottle opener, taster, and _____ (20) director
of Wine Discoveries, a newsletter that _____ (21) every two months. The Guide
_____ (22) Exceptional Wines Under \$8 is _____ (23) subtitle.

Mr. Damond could _____ (24) it a wine guide for _____ (25) rest of us. For
_____ (26) last two decades, he has _____ (27) a minor league manager
_____ (28) his stars depart for _____ (29) majors. How many little-known gems
_____ (30) wines has he seen _____ (31) from a few dollars to _____ (32)
bucks after a plug from _____ (33) critic of a big advertising _____ (34)? Not that he
hasn't _____ (35) back. "When I started _____ (36) 1976, I did only wines
_____ (37) \$4" he said, "but _____ (38) kept going up. I _____ (39) to \$5 and
then to \$6 _____ (40) finally \$8" He stopped at \$8 _____ (41) even then, bargains got
_____ (42) to find. So, now _____ (43) then, he pushes the _____ (44). For a
gift list, perhaps.

_____ (45) example, his Christmas roundup this year _____ (46) among other wines,
the 2001 Edna Valley Paragon Chardonnay, "_____ (47) personal favourite for years"
_____ (48) for \$9.95 to \$13.95. Or he _____ (49) bend the rules for _____ (50)
simply too good to _____ (51), like a delicious French Champagne, Jacques Trouillard
Brut, _____ (52) he found for \$12.99.

2. Appendix B - A Bargain Hunter's Best Friend (New, Story 2)

_____(1), they are still out _____(2), the cult vintners and their gullible fans.
_____(3) their days are numbered _____(4) that makes Arthur Damond happy.

For _____(5) 27 years, Arthur has been _____(6), editor, wine buyer, bottle
_____ (7), taster, and marketing director _____(8) Wine Discoveries, a newsletter
that appears every two _____(9). The Guide to Exception Wines _____(10) \$10 is
its subtitle.

_____ (11) Damond could call his _____(12) a wine guide for the _____(13)
of us.

Seems only _____(14) the wine magazines were full _____(15) snapshots of
smirking winemakers. Their _____(16) vintage, all three barrels of it _____(17) go
for \$300 a bottle. _____(18) didn't even have the _____(19) to blush.

Of course, why _____(20) when packs of instant connoisseurs – _____(21) of them,
dot-commers, bankers, and businessmen of _____(22) provenance – were elbowing
_____ (23) another aside, waving fistfuls of green?

_____ (24), we're all going to _____(25) the dough for gasoline.

For _____(26) last two decades, Arthur has _____(27) a minor league manager
_____ (28) his stars depart for _____(29) majors. How many little-known gems
_____ (30) wines has he seen _____(31) from a few dollars to _____(32)
bucks after a plug from _____(33) critic of a big advertising _____(34)?

Not that Arthur hasn't _____(35) back. "When I started _____(36) 1976, I did only
wines _____(37) \$4," he said, "but prices _____(38) going up. I went
_____ (39) \$5 and then _____(40) \$6 and finally \$8." He stopped at \$8
_____ (41) even then, bargains got _____(42) to find.

So, now _____(43) then, he pushes the _____(44). For a gift list, perhaps.
_____ (45) example, his Christmas roundup this year _____(46) among other wines,
the 2001 Edna Valley Paragon Chardonnay, " _____(47) personal favourite for years"
_____ (48) for \$9.95 to \$13.95.

Or he _____(49) bend the rules for _____(50) simply too good to _____(51),
like a delicious French Champagne, Jacques Trouillard Brut, _____(52) he found for
\$12.99.

3. Appendix C - Challenge to the Origin of a Florentine Chapel (Traditional, Story 3)

_____ (1) Pazzi Chapel in Florence is considered _____ (2) of the cornerstones of Renaissance _____ (3), and to most scholars, _____ (4) marks one of the _____ (5) of the career of _____ (6) great architect Filippo Brunelleschi, who is _____ (7) known as the man _____ (8) designed the dome of _____ (9) cathedral in Florence. Brunelleschi was a _____ (10) in 15th-century Italy somewhat like I. M. Pei _____ (11) 20th-century America, a celebrated architect who _____ (12) not only to attract a _____ (13) stream of commissions from _____ (14) rich and powerful but _____ (15) to win broad acclaim _____ (16) both populace at large _____ (17) serious scholars. And the _____ (18), put up in the mid-1440's _____ (19) the Pazzi banking family, rivals _____ (20) the Medici, seems to sum _____ (21) his ideas of Renaissance architecture _____ (22).

The problem, said Marvin Trachtenberg, an _____ (23) historian at New York University, is that Brunelleschi _____ (24) not design the Pazzi Chapel _____ (25) all.

Professor Trachtenberg, in a _____ (26) that is the equivalent _____ (27) architectural circles of making _____ (28) assertion that Leonardo did not _____ (29) one of his best-known _____ (30) or that Mozart did not _____ (31) one of his symphonies, _____ (32) his assertion in a pair _____ (33) long essays in, an Italian _____ (34) journal.

He contends that _____ (35) Pazzi Chapel is an imitation _____ (36) one of Brunelleschi's works, the Old Sacristy in Florence _____ (37) in, and that it _____ (38) designed by Michelozzo di Bortolommeo, a follower _____ (39) Brunelleschi who was known for _____ (40) willingness to copy the _____ (41) of others. (Mr. Trachtenberg, who _____ (42) been a professor of _____ (43) history at the N.Y.U. Institute of Fine Arts since 1967, _____ (44) to Michelozzo as "the Philip Johnson _____ (45) the 15th century.")

This is _____ (46) the sort of discovery _____ (47) will shake architecture to _____ (48) roots: after all the Pazzi _____ (49) has stood for more _____ (50) 500 years, who-ever designed it, _____ (51) its significance will not _____ (52) if it is proven _____ (53) to be by Brunelleschi. The _____ (54) influence of the building _____ (55) underscored just a few years _____ (56) when Mr. Johnson, of all _____ (57), used the facade of _____ (58) chapel, which is noted _____ (59) its high central arch _____ (60) by an open colonnade _____ (61) columns, as the inspiration _____ (62) the base of his A.T. & T. (_____ (63) Sony) Building in midtown Manhattan.

4. Appendix D - Challenge to the Origin of a Florentine Chapel (New, Story 4)

_____ (1) Pazzi Chapel in Florence is considered one _____ (2) the cornerstones of Renaissance architecture. _____ (3) most scholars, it marks _____ (4) of the highlights of _____ (5) career of the great _____ (6) Filippo Brunelleschi.

He is best known _____ (7) the man who designed _____ (8) dome of the cathedral in Florence.

_____ (9) the chapel, put up _____ (10) the mid-1440's by the Pazzi banking _____ (11), rivals to the Medici, seems _____ (12) sum up Brunelleschi's ideas _____ (13) Renaissance architecture perfectly.

The problem, _____ (14) Marvin Trachtenberg, an architectural historian at New York University, _____ (15) that Brunelleschi did not design _____ (16) Pazzi Chapel at all.

Brunelleschi was a _____ (17) in 15th-century Italy somewhat like I. M. Pei _____ (18) 20th-century America, a celebrated architect.

I.M. Pei _____ (19) not only to attract a _____ (20) stream of commissions from _____ (21) rich and powerful but _____ (22) to win broad acclaim _____ (23) both populace at large _____ (24) serious scholars.

Professor Trachtenberg makes his _____ (25) in a pair of long _____ (26) in Casabella, an Italian architectural journal.

_____ (27) gesture is the equivalent _____ (28) architectural circles of making _____ (29) assertion that Leonardo did not _____ (30) one of his best-known _____ (31) or that Mozart did not _____ (32) one of his symphonies.

Professor _____ (33) contends that the Pazzi Chapel _____ (34) an imitation of one _____ (35) Brunelleschi's works, the Old Sacristy in Florence.

_____ (36) also contends that it _____ (37) designed by Michelozzo di Bortolommeo, a follower _____ (38) Brunelleschi who was known for _____ (39) willingness to copy the _____ (40) of others.

Mr. Trachtenberg, _____ (41) has been a professor _____ (42) art history at the N.Y.U. Institute of Fine Arts _____ (43) 1967, refers to Michelozzo as "the Philip Johnson _____ (44) the 15th century."

This is _____(45) the sort of discovery _____(46) will shake architecture to
_____ (47) roots: after all the Pazzi _____(48) has stood for more _____(49)
500 years.

And who-ever designed _____(50), and its significance will _____(51) evaporate if
it is _____(52) not to be by Brunelleschi.

_____ (53) continued influence of the _____(54) was underscored just a
_____ (55) years ago. Then, Mr. Johnson, _____(56) all people, used the
_____ (57) of the chapel as _____(58) inspiration for the base _____(59) his
A.T. & T. (now Sony) Building in _____(60) Manhattan.

The chapel is noted _____(61) its high central arch _____(62) by an open colonnade
_____ (63) columns.

5. Appendix E - Columbian Leader's Appeal to the 'Common Man' Is Often Unheeded (Traditional, Story 5)

BOGOTA, Columbia, Jan. 31— _____(1) the last week, President Ernesto Samper, _____(2) is fighting for his _____(3) survival over allegations he _____(4) millions of dollars for _____(5) presidential campaign from Columbia's most _____(6) drug dealers, has taken _____(7) portraying himself as a _____(8) of the common man _____(9) is under attack for _____(10) social commitment.

But if this _____(11) raised fears of class warfare among upper-class _____(12), it is by no _____(13) clear that Mr. Samper _____(14) the widespread support of _____(15) who park cars, sell lottery tickets , or peddle cigarettes one _____(16) one to eke out a _____(17).

On a busy thoroughfare in _____(18) Bogota, the people who usually _____(19) just a few words _____(20) office workers and tourists seemed as divided _____(21) educated Columbians about the _____(22) their President's troubles is _____(23) on the country. And _____(24) seemed just as fearful _____(25) upper-crust Columbians of the uncertainty _____(26).

Ofelia Leone, 25, sells pamphlets on the Colombian penal law _____(27) the streets. But she _____(28) to accept that politicians operate _____(29) the law. Still, that _____(30) no reason to boot Mr. _____(31) out, she said.

"The Government _____(32) being too discredited," she said. " _____(33) he did accept the _____(34), but he's not the _____(35) one. He's already President, and _____(36) is just one more scandal. _____(37) should be allowed to _____(38) out his term. For _____(39), he's innocent, and they should _____(40) picking on him"

She added _____(41) she expected the Congress, which opened a _____(42) session on Tuesday to determine _____(43) President's fate, to clear _____(44) Samper.

Jorge Alvaro Rodriguez, 67, sells candy and cigarettes – _____(45) the pack or one by _____(46) – from a stand _____(47) size of a suitcase. He, _____(48), was not certain of _____(49) President's guilt or innocence. _____(50) he feared the consequences _____(51) political instability.

6. Appendix F - Columbian Leader's Appeal to the 'Common Man' Is Often Unheeded (New, Story 6)

BOGOTA, Columbia, Jan. 31 – President Ernesto Samper _____(1) fighting for his political _____(2) over allegations he solicited _____(3) of dollars for his _____(4) campaign from Columbia's most _____(5) drug dealers.

Over the _____(6) week, he has taken _____(7) portraying himself as a _____(8) of the common man _____(9) is under attack for _____(10) social commitment.

But if this _____(11) raised fears of class warfare among upper-class _____(12), they are not alone.

Jorge Alvaro Rodriguez, 67, _____(13) candy and cigarettes – by the pack or _____(14) by one – from a _____(15) the size of a suitcase. _____(16), too, was not certain _____(17) the President's guilt or _____(18).

But he feared _____(19) consequences of political instability.

_____ (20) is by no means _____(21) that Mr. Samper enjoys _____(22) widespread support of people _____(23) park cars, sell lottery _____(24), or peddle cigarettes one _____(25) one to eke out a _____(26).

On a busy thoroughfare in _____(27) Bogota, the people who usually _____(28) just a few words _____(29) office workers and tourists seemed as divided _____(30) educated Columbians about the _____(31) their Presidents' troubles is having _____(32) the country.

And they _____(33) just as fearful as upper-crust _____(34) of the uncertainty ahead.

Ofelia Leone, 25, _____(35) pamphlets on the Columbian penal law on the _____(36). But she seemed to _____(37) that politicians operate outside the _____(38). Still, that was no _____(39) to boot Mr. Samper out, _____(40) said.

"The Government is being too _____(41)," she said. "Maybe he _____(42) accept the money, but _____(43) not the first one. _____(44) already President, and this is _____(45) one more scandal. He should _____(46) allowed to finish out _____(47) term. For me, he's innocent, _____(48) they should stop picking on _____(49)"

She added that she _____(50) the Congress, which opened a special _____(51) on Tuesday to determine the _____(52) fate, to clear Mr. Samper.

7. Appendix G - Information Letter Given to Reading Test Subjects

Principal Investigator(s) and Degree(s):

Ravi Singh B.Sc., M.Sc. Candidate

The University of Alberta

780-492-8850

Purpose:

The purpose of this project is to determine the readability of the new “online” paragraph versus the traditional definition of the paragraph. A traditional paragraph usually starts with a topic sentence followed by several sentences giving detail about the topic and followed by one concluding sentence. The new paragraph, on the other hand, has no formal definition. The top twenty English language daily online newspapers in the world use this format exclusively and is also the major format in medical and government web sites such as the Mayo Clinic and army.mil.

A software tool was created to provide a definition of the new paragraph. You will read two documents, one in the traditional format and one in the new format. Every fifth word is missing and you will fill in the blanks with your best guess. Your ability to fill in the blanks is a measure of the readability of the text. This is called a cloze test.

The cloze test scores will be collected for my Master’s Thesis.

Background

The new paragraph is the only paragraph format found in the top twenty English language online newspapers in the world. A literature search shows that no definition of this paragraph exists. A practical definition for the new paragraph has been made via a new software tool. The planned benefit of this project is to be able to provide hard proof as to how readable the new paragraph is versus the traditional one.

Participants are being recruited who are over the age of eighteen and who have a working knowledge of English. They are being selected based on geographical location in the city of Edmonton.

Benefits

The new paragraph is shorter than the traditional paragraph yet it contains less information to perform a cloze test. What this means is that it is not obvious which paragraph is more readable.

What could be revealed is which paragraph has more readable overall. The benefit to society is that some proof will be available as to which format is more readable.

There are no anticipated benefits to participants overall.

Risks

None

Confidentiality

To ensure confidentiality, personal information will be coded and stored in a locked file cabinet or stored in an encrypted format to which only the investigators have access. Information is normally kept for a post-publication period of two years, after which it will be destroyed. If no publications are forthcoming, the data will be destroyed in five years. The measures taken to protect your anonymity, and the judgmental nature of the issues involved, minimize the potential for harm to you from any responses made while participating in this study. While an absolute guarantee of anonymity cannot be provided, all research safeguards and best practices will be followed in handling research data. Note that participants will NOT be identified in any future presentations or publications.

Third Party Contact Statement

If you have concerns about this study, you may contact Dr. Steve Dew, Associate Dean (Research), at (780) 492-7370. Dr. Dew has no direct involvement with this project.

Removal of data when a participant withdraws during a study

If you decline to continue or you wish to withdraw from the study, your information will be removed from the study upon your request.

8. Appendix H - Consent Form Given to Reading Test Subjects

Informed Consent Form

Part 1 (to be completed by the Principal Investigator)

Title of Project:

Readability of the Online Paragraph versus the Traditional Paragraph

Principal Investigator(s):

Ravi Singh

Co-Investigator(s):

Include affiliation(s) and phone number(s):

Not Applicable

The University of Alberta (780) 492-8850

Part 2 (to be completed by the research participant)

Do you understand that you have been asked to be in a research study? Yes No

Have you read and received a copy of the attached Information Sheet Yes No

Do you understand the benefits and risks involved in taking part in this research study? Yes No

Have you had an opportunity to ask questions and discuss this study? Yes No

Do you understand that you are free to refuse to participate, or to withdraw from the study at any time, without consequence, and that your information will be withdrawn at your request? Yes No

Has the issue of confidentiality been explained to you? Do you understand who will have access to your information? Yes No

This study was explained to me by: _____

I agree to take part in this study:

Signature of Research Participant

Date

Witness

Printed Name

Printed Name

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.

Signature of Investigator or Designee

Date

THE INFORMATION SHEET MUST BE ATTACHED TO THIS CONSENT FORM AND A COPY OF BOTH FORMS GIVEN TO THE PARTICIPANT.