HOW READABLE ARE ENVIRONMENTAL POLICY STATEMENTS? AN EXPLORATORY STUDY WITHIN THE IT INDUSTRY

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Abstract

Environmental policy statements are nowadays fairly ubiquitous, particularly among large organizations. Such statements continue to be seen as an important element in the sustainability initiatives of organizations. However, if they are to have a chance of achieving the desired positive outcomes that those in their favor highlight, they must first be readable and comprehensible to the targeted stakeholders. To investigate the readability of environmental policy statements of IT companies, the individual environmental policy statements of Information Technology companies were collected. A readability calculation tool was then employed to assess the readability of each of these environmental policy statements. Results are reported, and the implications are considered, while limitations are noted and directions for future research are identified.

Keywords: Environmental Policy Statement, IT Company, Sustainability, Organizational Strategy

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Are it company environmental policy statements readable? Evidence from the top 100

As global concern for the future of our physical environment has increased, many organizations, government departments and agencies and not-for-profit groups have attempted to articulate their stance on these issues. Prompted by environmental disasters like the Exxon Valdez calamity and the more recent BP Gulf oil catastrophe, questions are being asked of governments and companies alike. Companies are being queried about their policies regarding the environment, and governments are being held accountable by their electorates for ensuring that business acts in a responsible manner, and punished when it doesn't.

Environmental impact statements are documents required by the National Environmental Policy Act under United States federal environmental law, to guide federal government agency actions "significantly affecting the quality of the human environment" (National Environmental Policy Act, 1969). Most large companies today have published environmental policy statements as part of annual reports, or as documents communicated to shareholders, suppliers, employees, customers and other stakeholders. There are consultants and websites offering assistance in the writing of environmental policy statements (e.g. Striano, 2008), or that provide free, adaptable environmental policy statements (http://www.environmentalpolicy.org.uk/statement.html).

The Information Technology (IT) industry has not been immune to accusations concerning its impact on the environment. On the contrary, the industry is seen as both an excessive consumer of resources, and an extreme producer of harmful waste. The energy demands of the Internet are increasing by more than 10 percent each year. The power usage of the computer industry has gone from being relatively small to overtaking other sectors like the airline industry. U.S. data centers, for example, used 61 billion kW of power in 2006, enough to supply the U.K. with energy for two months, accounting for 1.5 percent of the electricity used by the U.S. (Ellicott, 2009). As a maker of waste, the computing industry discards materials that contain a multitude of toxic substances including dioxins, cadmium, chromium, radioactive isotopes and mercury. Computer monitors contain more than 6 percent lead by weight (between 1.5 and 8 pounds in the lead glass of a cathode ray), and circuit boards contain lead-tin solders likely to leach into groundwater or to create air pollution via incineration (Royle, 2005). Most IT firms, particularly the larger multinationals, are aware of the situation and have attempted to articulate their stances on these issues by publishing environmental policy statements.

Those who write an IT company's environmental policy statement not only do so with internal (shareholders and employees) or external (suppliers and customers) audiences in mind; they also need to ensure that their environmental policy statements are clear and comprehensible to a larger audience, including government, media, environmental action groups and the general public.

In all likelihood, IT companies devote considerable effort to the development and adoption of environmental policy statements, given the strategic and public relations importance, and the fact that they necessarily seek multi-stakeholder targets. IT firms undoubtedly hope that the different stakeholders not only read them, but also understand what they are trying to communicate. Understanding the written environmental policy statement could have desirable consequences in terms of comprehension, interest and enhancement of the reputation and standing of the firm. At the heart of this comprehensibility of the environmental policy statement is readability. In order to be understood, an environmental policy statement should be readable.

The level of readability of environmental policy statements has received limited attention in the literature, and this is particularly true in the case of the environmental policy statements of IT companies. Given a desire for conciseness on one hand and aspirations toward the inclusion of all topics needed to meet the expectations of different stakeholders on the other, it is not surprising that many statements may not be seen to be particularly easy to comprehend in any meaningful way. If environmental policy statements are to be useful and understandable by all, they need to be readable. In this paper we report the results of a study that investigated these issues.

We begin by first considering the role of environmental policy statements in organizations with particular reference to IT companies, and then the notion of readability. Then we proceed to collect the environmental policy statements of the IT companies in the Greenfacts (http://www.greenfactorstudy.com/) rankings of 2009, and employ content analysis and appropriate scores to investigate the readability of the environmental policy statements gathered. The results are reported and some similarities and differences are explored. Finally, the implications are considered, the limitations are acknowledged, and directions for future research are noted.

Environmental Policy Statements and Their Relevance to IT companies

An environmental policy statement has been defined as a "written set of principles that outlines a company's mission to manage the environmental effects of its people, activities, and operations and helps to put its environmental commitments into practice" (Striano, 2008). It is an attempt by an organization to delineate the nature of its stance toward the environment and the firm's environmental practices. The statement should give clear direction to the organization's employees, management, shareholders, customers, suppliers and other stakeholders as to where it stands on environmental matters, specifically with regard to how the organization will and will not act.

The benefits of a well-written, clear, environmental policy statement are not inconsiderable. The statement provides guidance to decision-makers and employees, and enables the organization to clearly position itself in the eyes of current and potential customers. It provides a reassurance to the general public that the firm is aware of and committed to managing its impact on the environment. This should permit the organization to maintain better relationships with governmental agencies and NGOs concerned with the environment. Not least of the benefits of a well-written and sound environmental policy is the fact that it can be a powerful marketing and public relations tool.

The environmental policy statement is an integral part of the communication and strategy of any IT company. Recognizing the impact that IT companies can have on the environment, the action group Greenpeace devotes considerable space on its website to providing a "guide to greener electronics" and to ranking IT companies in terms of their environmental efforts (http://www.greenpeace.org/international/campaigns/toxics/electronics/how-the-companies-line-up/). Greenpeace also encourages website visitors to take action to get IT firms to not only "act greener" but also adhere to their stated policies. For example, a click through banners on the site (on September 29th, 2010) exhorts surfers to "Take action: Tell Dell to phase out the use of toxic chemicals".

Readability and Comprehension

Readability is foundational to the communication process. Readability is an assessment of the quality, content and style of written language that may be attributable to a document as related to the ease of reading and comprehension from the perspective of the audience. A measure or impression of readability is multi-faceted, including such technical characteristics as sentence structure, vocabulary and word length, as well as more qualitative measures such as legibility, tone and content layout (Klare, 1963). The study of readability takes into account that comprehension and understandability is as much (or more) reader-centered as author-centered, and therefore must take into account subjective factors related to the audience such as reader competence and reader motivation (Klare, 1980).

Much of the research on readability has concluded that text that is considered easy to read – relative to the intended audience – improves comprehension, retention, reading speed and reader persistence. Measures and approaches for estimating readability compare appropriateness of text content, both semantic and syntactic, to its accessibility by various audiences and education or grade levels (Gray and Leary, 1935).

Readability and effective writing have long been a concern in management. The importance of readability has been stressed in many business disciplines, including

finance and accounting (e.g. Blouin, 2010; Li, 2008), marketing (e.g., Mackey and Metz, 2010; Milne, Culnan and Greene, 2006; Kover, 2002; Leong, Ewing and Pitt, 2002; Clark, Kaminski and Brown, 1990; Kaminski and Clark, 1987) and public relations (e.g. Geary, 2001), recognizing that if readability and comprehension are not successful among the target stakeholders of a given piece of writing, the author's desired intent of writing the piece may not be achieved. A seminal paper on effective report-writing by Ehrenberg (1982) provides a number of useful guidelines under five main headings, namely: 1. Start at the End; 2. Be Prepared to Revise; 3. Cut Down on Long Words; 4. Be Brief; and 5. Think of the Reader.

A number of measures and formulae have been developed that sought to establish standards or benchmarks for assessing the level of difficulty of a piece of reading material (for a detailed review see Zakaluk & Samuels, 1988). Six of the most recognized and utilized methodologies for measuring readability are outlined below: the FOG Index, the Reading Ease Score, the Grade Level Score, SMOG, the Coleman-Liau Index and the Automated Readability Index.

One of the most widely used indices to assess report writing is Gunning's FOG index (1952). While Gunning's early work focused on children's texts, the FOG Index lends itself particularly well to reports and papers. Ehrenberg (1982) puts forward a simplified description of the FOG index as follows: "We count the words of three or more syllables and the number of sentences on about half a page of writing. (I count the long words in my head and the sentences on my fingers.) We then divide the number of long words by the number of sentences." He notes that:

"A piece with a fog-factor of 2 or 3 remains easy to read. If the count goes up to 4 or 5, it becomes heavy going. Yet academic and technical writing often averages 6 to 8 long words per sentence, and sometimes more than 10. Which is why it is like it is. (Long words strain our short-term memory. They make it difficult to remember how a sentence started by the time we reach its end.)"

The SMOG Measure (Simple Measure of Gobbledygook) was developed by McLaughlin (1969) as a more accurate and easily calculated substitute for Gunning's FOG Index. SMOG calculations are based loosely on counting the number of words with three or more syllables in a given number of sentence samples, and estimates the years of education needed to completely understand a piece of writing. The SMOG Measure is widely used, particularly in the healthcare industry (e.g. Hedman, 2008).

Rudolf Flesch (1948) concerned himself specifically with devising a measure of readability for adult material. He proposed two measures of readability: the Flesch Reading Ease Score, and the Flesch–Kincaid Grade Level Score. Flesch's Reading Ease Score is based on the computation of Average Sentence Length (or ASL, the number of words divided by the number of sentences) and Average Number of Syllables per Word (or ANS, the number of syllables divided by the number of words). The ASL and ANS are calculated and weighted to provide a score on a 100-point scale with higher scores related to greater ease of understanding. For most documents, Flesch recommended a target readability score of approximately 60 to 70. Various government agencies and institutions around the world employ the Flesch Reading Ease Score to access the readability of their public documents and forms, and the Score is often bundled with word processing software including Microsoft Office Word. The Flesch–Kincaid Grade Level Score also uses ASL and ANS but employs different weightings so that results correspond to U.S. school grade levels. For example, a Flesch–Kincaid Grade Level Score of 8.0 means that an eighth grader should be able to understand the document, and so forth. The two scales correlate approximately inversely with each other.

The Coleman-Liau Index (Coleman and Liau, 1975) and Automated Readability Index (Senter and Smith, 1967) took a slightly different approach to gauge the understandability of a piece of text, with the intent of capitalizing on technology to assist in calculation. Their outputs again approximate the U.S. grade level thought necessary to comprehend a piece of text, but unlike the previous four other indices, the CLI and ARI refer to characters per word rather than syllables per word. Operating on the premise that characters (as related to word and sentence length) are more readily and accurately counted mechanically than are syllables, the CLI and ARI were some of the first tests designed to exploit technology in the analysis of readability.

While early computing and text scanning devices could be used to count characters without assessing text, current computer technology has the ability to cope easily with both approaches. Recent versions of Microsoft Word, for example, have Flesch's Reading Ease Score and the Flesch–Kincaid Grade Level Score built into their programming, and dedicated websites such as http://www.read-able.com/ enable users to calculate multiple readability indices in a very short time.

A key requirement for any environmental policy statement is that it will be readable and understandable, and as with any effective written communication, it is necessary to consider both the writing and the target readership in assessing readability. The latter, however, is particularly challenging with respect to environmental policy statements as there are often multiple target stakeholder and readership groups with varying levels of education and sophistication. It is not surprising that many environmental policy statements can be seen as confusing or difficult to comprehend, given the simultaneous needs to a) remain concise, b) remain approachable and understandable for all target stakeholder groups, and c) meet the content expectations of these various groups with often unrelated areas of interest. Failure of many statements to understand and balance these three requirements, resulting in a lack of readability for one or more stakeholder groups, stokes the growing cynicism with which many environmental policy statements are met, both by those within an organization and outside of it.

The Study Methodology

As stated earlier, this study of information technology company environmental policy statements focuses on the 25 IT companies identified by Greenfacts (http://www.greenfactorstudy.com/). GreenFactor is a joint research initiative between Strategic Oxygen and Cohn & Wolfe, both consulting companies, to "illuminate 'green' marketing opportunities and further 'green'-focused research on a global scale". GreenFactor's (2008) study surveyed 11,740 IT professionals of small, medium, and large companies in 13 countries. Respondents are asked to identify 6 IT brands that they most associated with being "green", which was defined as "efficient power consumption, recyclable/reusable packaging, recycling offers for older equipment, use of non-toxic materials, or making investments in future green concepts such as alternative materials" (GreenFactor, 2008).

The first phase of the methodology therefore involved extracting as many environmental policy statements from the 25 IT companies' websites as possible. Each environmental policy statement's text was imported in to an Excel spreadsheet along with the company's name and its ranking in the Greenfactor study. This was later reduced to terciles, based on "High", "Medium" and "Low" perceived "greenness" of the IT company brands. Then the text of the environmental policy statement was analyzed using the Readability Test Tool (www.read-able.com). This is a free online service that permits the user to analyze the readability of any piece of text, whether it be text from a website, a piece of text input directly, or text from a link on a web page. The site then analyzes the text and reports on its readability with regard to the:

- *Flesch Kincaid Reading Ease Score*
- *Flesch Kincaid Grade Level*
- *Gunning Fog Score*
- *SMOG Index*
- *Coleman Liau Index*
- *Automated Readability Index*

And also the:

- *Number of sentences*
- *Number of words*
- *Number of complex words*
- *Complex words as a percent of total words in the script*
- *Average words per sentence*
- *Average syllables per word*

The Results

The results of the readability analysis of the environmental policy statements of the Greenfactor IT companies are presented in Table 1, for all the indicators outlined above. The mean, standard deviation, minimum and maximum scores for each of the readability measures, as well as the basic descriptives of the text (number of sentences, words, etc) are reported. It will also be noted that an "Average Grade Level" is also reported in the table – this is a simple average of the scores on the combined Flesch Kincaid Grade Level, Gunning Fog Score, SMOG Index, Coleman Liau Index and Automated Readability Index measures. In simple terms the scores in Table 1 should be interpreted as follows: Ideally, the score on the Flesch Kincaid Reading Ease measure should be positive and high, the scores on the Average Grade Level, Flesch Kincaid Grade Level, Gunning Fog Score, SMOG Index, Coleman Liau Index and Automated Readability Index are better low than high, and the scores on the number of sentences, number of words, complex words, percent of complex words, average words per sentence and average syllables per word are better low than high.

Table 1: Descriptive Statistics – Readability Measures of IT company Environmental policy Statements

Indicator	Mean	Std. Deviation	Maximum	Minimum
Flesch Kincaid Reading Ease	34.62	12.11	62.30	10.30
Flesch Kincaid Grade Level	10.38	1.91	15.20	1.91
Gunning Fog Score	10.44	2.63	15.50	2.63
SMOG Index	8.19	1.72	12.00	1.72
Coleman Liau Index	18.60	2.28	21.60	2.28
Automated Readability Index	10.02	2.20	15.00	2.20
Average Readability	11.53	1.74	15.32	1.74
No. of sentences	131.28	114.44	477.00	5.00
No. of words	750.08	499.15	2431.00	8.00
No. of complex words	177.08	116.39	524.00	1.00
Percent of complex words	24.30	5.99	38.30	5.99
Average words per sentence	7.85	3.77	17.89	2.75
Average syllables per word	1.91	0.15	2.17	0.15

It is clear from Table 1 that the readability of the environmental policy statements of the Greenfactor IT companies varies greatly. The Flesch Kincaid Reading Ease score mean is 34.62 with a standard deviation of

12.11. The range of readability on this indicator is considerable – one company scores a high of 62.30, which means that its environmental policy statement is extremely readable, while the lowest score is 10.30, which means that the company's environmental policy statement borders on incomprehensibility. The range on all the grade level indices is also extremely wide, with some firms' environmental policy statements being extremely easy to read, and others requiring high levels of education to be comprehensible. For example, the highest score on Gunning's Fog Index is 15.50, which means that in rough terms, in order to understand it, an individual would need around 16 years of education. Texts that are designed for a wide audience generally require a Fog index of less than 12, while texts that require a close-to-universal understanding generally require an index of less than 8 (Gunning, 1952). Similarly, one of the firms studied has an environmental policy statement with readability on the Coleman Liau index of 21.60, which means that an individual would require 22 years of education (equivalent to a PhD), to be able to read and comprehend it easily.

In order to see whether the readability of environmental policy statements differed by IT company ranking in the Greenfactor study, we divided the firms into terciles (as previously described), and compared the Flesch Kincaid Reading Ease Scores and the Average Readability Indices across the terciles, using simple analysis of variance (ANOVA) procedures. The results of this analysis are presented in Exhibit one.

It is clear from Exhibit 1 that there are no significant differences across the terciles in terms of the readability of the environmental policy statements of the IT companies measured by the Flesch Kincaid Reading Ease Score. However, perusal of the diamond plot in the exhibit seems to suggest that there is a possibility that the environmental policy statements of the "High" greenness tercile of IT firms might indeed be more readable than the medium and (particularly) the low terciles. The reasons for this are obviously debatable, open to speculation, and worthy of future investigation. It could be that the greener companies have thought more clearly and carefully about their environmental policy statements, and have spent more time on making their environmental policy statements clearer and more readable. It could also be that these firms, once having formulated their environmental policy statements, have then engaged the services of writing professionals, perhaps in an ad agency or PR consulting firm, to rewrite their environmental policy statements to make them more readable. The same phenomenon is observable but to a lesser extent (and is also not significant) in the case of the Average Readability index (a mean of the means of the summed Flesch Kincaid Grade Level, Gunning Fog Score, SMOG Index, Coleman Liau Index and Automated Readability Indices). There is a possibility that the environmental policy statements of the greener IT brands require fewer years of education to be comprehended.

The mean Flesch Reading Ease Score for all firms in the sample stands at 34.62 (sd = 12.11). Numerous sources (e.g. Kerr, 2007) state that Reader's Digest magazine has a readability index of about 65, Time magazine scores about 52, and the Harvard Law Review has a general readability score in the low 30s. When one considers that the higher the score on the 100–point index of the Flesch Reading Ease scale, the higher the ease of reading, and that most organizations that make use of this score target a minimum score of 60, it is clear that on average the readability of the environmental policy statements of the IT companies in our sample is low. The same can be said for the scores on the all the Grade Level indicators, where the mean for all the firms in the sample is 11.53 (sd = 1.74), with a high grade score of 15.32. The interpretation of this is that for the reader to understand what is being said in the average IT company environmental policy statement would require some 12 years of schooling, and at the extreme, to have at least attended university. Many people would likely have difficulty understanding what some IT firms are trying to communicate in their environmental policy statements.

This raises the issue of whether those who manage IT companies should seek to develop environmental policy statements targeting different stakeholders. The most useful purpose of environmental policy statements may be primarily as an internal tool to help senior executives crystallize their thoughts in the pursuit of a sound environmental policy. If it is anything else, such as communicating this stance to others, including customers and employees and the general public (some of whom may not have completed high school), then problems might occur.

Limitations, Managerial Implications and Avenues for Future Research

Limitations

Environmental policy statements are, of course, not the only tools that IT companies use to communicate their stances on sustainability and the environment with stakeholders. Generally, such messaging is communicated by a range of communication styles activities, and communications tools than environmental policy statements have not been included or assessed in this study.

Without definition of target audiences by the corporate authors, it is conceivable that some of the environmental policy statements analyzed in this research have been constructed by senior executives for stakeholders such as other senior managers, investors and senior government officials who the authors assume would have above-average abilities to comprehend complex or sophisticated written language or subject matter.

This study used the environmental policy statements of 25 of the Greenfactor companies for analysis. While this is a reasonable sample considering organizational typology, we do recognize that the data collected has therefore not included large and small IT companies all over the world not included in the Greenfactor ranking.

Additionally, the analysis herein represents data from a "snapshot" in time and is therefore representative only of the environmental policy statements of the 25

companies in Fall 2009, and does not reflect any changes that may have occurred since. Indeed, if any of the companies in question have changed or revised their environmental policy statements significantly since then a re-analysis of the data could result in notably different readability scores.

Managerial Implications

This study suggests that, generally, the environmental policy statements of many IT companies (such as the 25 included in this study) are written at a level of comprehension greater than that of the audience, leading to lower than average measures of readability.

It is our recommendation for management, then, to take into account the average reader skill and comprehension level of the largest group of target stakeholders when writing single and universal environmental policy statements. In most cases, we assume, this would entail revising policy statements from a senior management or government level "down" to the readability and comprehension levels of the general public or a certain public demographic group.

That said, it is arguably easy to over-emphasize the education-related aspect of readability. In fact, it may well be the case that even highly educated executives and public officials prefer to read and better comprehend text that is written at a lower readability level. There may be a subtle difference between a document being "not difficult" to read (i.e., "I can understand it") and "easy" to read (i.e., "Not only can I understand it, but I can read it easily and enjoy reading it"). While the audience's prior education, knowledge of the subject matter and reading skill will, intuitively, determine their comprehension, it can similarly be argued that the audience's interest in and motivation toward the subject matter of the environmental policy statement will determine the extent to which they believe in and act on it (Gray and Leary, 1935).

Avenues for Future Research

A number of worthwhile directions for future research are suggested by the findings of this study. First, it would be worthwhile in future studies to include a larger sample of various-sized IT companies – if possible, including firms that were nominated for, but not included in, the Greenfactor study. There are also other corporate ranking systems (for example, Greenpeace), which may yield a very different ordering or set of data than the Greenfactor rankings. In this light, interesting comparisons could be made between ranking systems and ranking priorities. The environmental policy statements of exclusively non-ranked IT companies could also be included in analyses, then compared with data found in the sets of ranked companies. This comparison might shed further light on our observations above that readability of environmental policy statement tends to deteriorate as corporate ranking decreases.

Second, a more detailed computerized content analysis of the readability of environmental policy statements in the current sample, or in future samples suggested above, would shed further light on the nature of the text contained within them. For example, WordStat (Peladeau, 1999) permits users to impose concept-representative dimensions so a piece of text can be analyzed in terms of the frequency with which the predetermined concepts occur. Then, using correspondence analysis (Greenacre, 1993), different types of organizations can be contrasted against the concepts and placed on a two-dimensional perceptual map that facilitates graphic interpretation.

Another type of computerized content analysis, Leximancer, could also provide useful insights into the content of environmental policy statements. Leximancer is a software program designed for interpreting and visualizing complex textual communication. The program uses data-mining technology to interpret prose data and identify the main concepts in a body of text, and relate these concepts to one another using conceptual-thematic and relational-semantic analyses (for a detailed description see Rooney, 2005). Once a concept has been identified, the software goes beyond keyword definition and searching by creating a thesaurus of closely related word phrases that tend to travel together. The program then displays a visual concept map that portrays the main concepts and their interrelationships.

Conclusion

In this paper we have described a study of the readability of the environmental policy statements of the IT companies in the Greenfactor sustainability rankings. We sought to answer the question of whether or not these environmental policy statements were in fact "readable" or not. Our conclusion is that the environmental policy statements, generally speaking, are not readable at average comprehension levels. In some cases, the environmental policy statements included in this study required almost unrealistically high education and reading skill for comprehension.

If the target audience of the policy statements has average or lower reading skills, we argue that the environmental policy statements will not be understandable and therefore useful to the stakeholder groups they are intended for. Even where target audiences are more educated and sophisticated, less readable environmental policy statements will be less likely to interest, engage and motivate these stakeholders.

Some of the most successful popular writers of our time, such as John Grisham and Stephen King, write at a Flesch-Kincaid grade level of 7. Laws in many parts of the world require that medical and safety information be written at a Flesch-Kincaid grade level of 5 (Doak, Doak and Root, 1996). As the cultural historian Jacques Barzun said, "Simple English is no person's native tongue" (see http://www.the-rathouse.com/JacquesBarzun.html).

Those who write the environmental policy statements of IT firms would do well to remember that writing for readers who may not be as sophisticated or educated as the author can be difficult, and takes of careful thought and practice.

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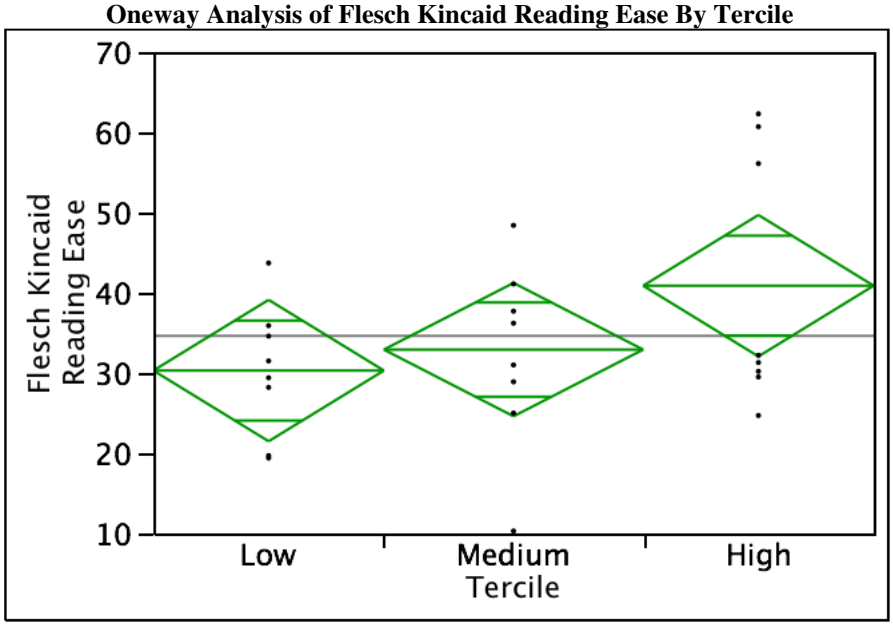
Exhibit 1: ANOVAs – Flesch Kincaid Score and Average Index By Tercile

Oneway Analysis of Flesch Kincaid Reading Ease By Tercile



Oneway Anova: Summary of Fit

Rsquare	0.133205
Adj Rsquare	0.054406

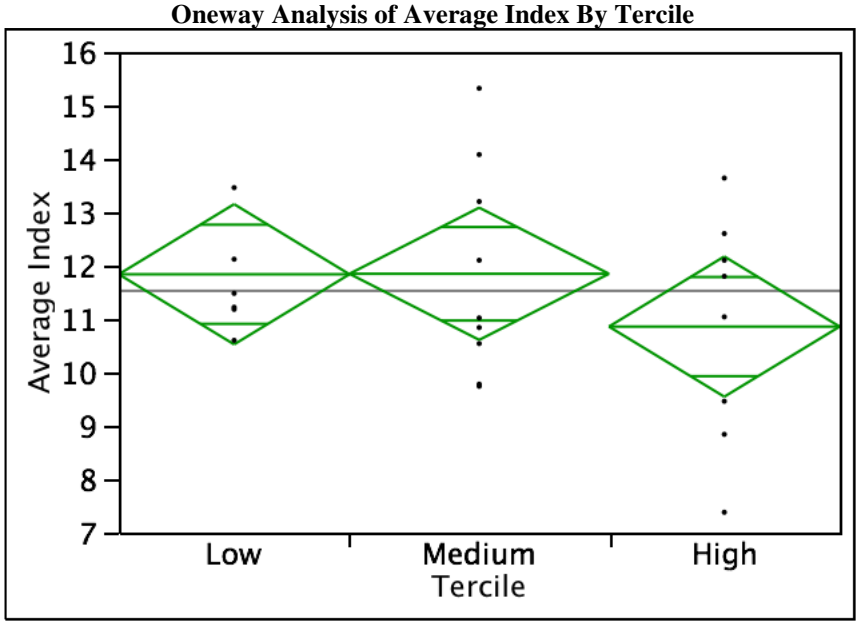
Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Tercile	2	488.5817	244.291	1.6904	0.2075
Error	22	3179.3039	144.514		
C. Total	24	3667.8856			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Low	8	30.3000	4.2502	21.486	39.114
Medium	9	32.9111	4.0071	24.601	41.221
High	8	40.8750	4.2502	32.061	49.689

Oneway Analysis of Average Index By Tercile



Oneway Anova: Summary of Fit

Rsquare	0.069562
Adj Rsquare	-0.01502

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Tercile	2	5.276804	2.63840	0.8224	0.4524
Error	22	70.580700	3.20821		
C. Total	24	75.857504			

Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
Low	8	11.8375	0.63327	10.524	13.151
Medium	9	11.8467	0.59705	10.608	13.085
High	8	10.8575	0.63327	9.544	12.171

Appendix 1

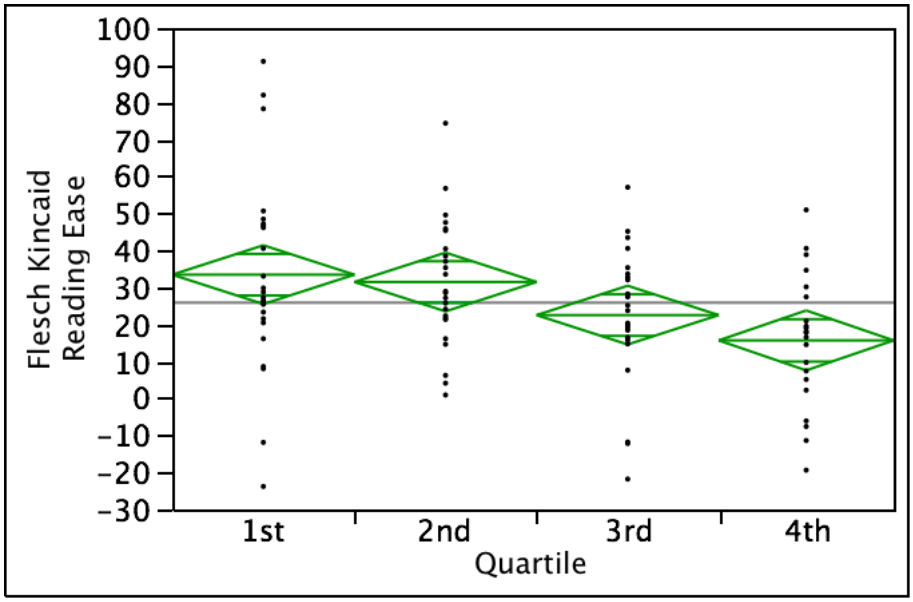


Figure 1. Oneway Analysis of Flesch Kincaid Reading Ease By Quartile

Table 2. Oneway Anova: Summary of Fit

Rsquare	0.116244
Adj Rsquare	0.088336
Root Mean Square Error	19.97822
Mean of Response	25.83737
Observations (or Sum Wgts)	99

Table 3. Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Quartile	3	4987.422	1662.47	4.1653	0.0081*
Error	95	37917.270	399.13		
C. Total	98	42904.692			

Table 4. Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
1st	25	33.4000	3.9956	25.468	41.332
2nd	25	31.4240	3.9956	23.492	39.356
3rd	25	22.4760	3.9956	14.544	30.408
4th	24	15.6417	4.0780	7.546	23.738