RESEARCH ARTICLE

THE SUITABILITY OF THE FRY AND SMOG READABILITY FORMULAE IN DETERMINING THE READABILITY OF FILIPINO TEXTS

Merry Ruth M. Gutierrez

Abstract

The descriptive quantitative study evaluates English and Filipino passages by subjecting them to two readability formulae to determine the difficulty level and suitability of the texts to the intended reader level. The evaluation results show that among all the passages taken from the English textbooks, only 6.01% and 8.41% matched the target level based on Fry and SMOG (Simple Measure of Gobbledygook) formulae respectively. The majority of the passages in English did not get any results; thus rated as invalid. The SMOG evaluation showed that the majority of the passages rose higher by two or more levels than the intended reader level. Meanwhile, among all the Filipino passages evaluated, none matched the intended level; the majority was rated invalid, and many did not show any result based on the Fry readability formula. The SMOG evaluation showed that the majority of the passages stood higher by six to ten levels than the intended reader level. Results suggest that the existing readability formulae may not be applicable to passages in Filipino and Philippine English, and this calls for the development of a readability formula for Filipino texts in both languages.

Keywords: *readability, Fry readability formula, SMOG*

INTRODUCTION

The Philippines is a multilingual country with almost 170+ languages spoken as first language by approximately 100 million Filipinos. Yet

there are two major languages constitutionally- mandated as official languages in the country- English and Filipino. For many, these two languages are learned formally in the school setting as their second language, and inevitably are used as the language of school textbooks in the form of instructional materials.

One challenge in the educational system – the multi-lingual situation in the country – is further compounded when the textbooks seem to be difficult for the target users that they hardly learn concepts and ideas which the textbooks are purported to explain, reinforce, and stress. Many times, learners are blamed for their inability to tackle textbook contents; very seldom is the text factor pointed as one source of problem to readers. This study, therefore, attempts to probe linguistic features of the text as possible impediment to comprehension, especially in multilingual contexts like the Philippines.

The difficulty and suitability levels of textbooks need to be determined since ideally, they aim to facilitate understanding and develop conceptual knowledge among learners who spend most of their time reading academic textbooks. More pointedly, it is vital to find out how textbooks match the students' needs and abilities in comprehending ideas presented to them so that the text factors that impede comprehension maybe identified and addressed accordingly.

The study aimed to evaluate the readability levels of English and Filipino passages by using SMOG (Simple Measure of Gobbledygook) and Fry Readability formulae, the results of which were compared to the identified target levels indicated in the books to establish a match or mismatch between the two.

The Philippine Normal University, as the National Center for Teacher Education, undertook this study to serve as basis for possible textbook revision and influence the preparation of learning/resource materials suited to the demands of the K-12 curriculum. With the new curricular thrusts, instructional materials have to be meticulously studied and evaluated so that they can help achieve the goals set by the curriculum; hence, this study on the evaluation of readability levels of English and Filipino passages

was pursued.

Specifically, the study sought to answer the following:

1. What are the readability levels of English passages across grade and year levels when subjected to Fry and SMOG formulae?

2. What are the readability levels of Filipino passages across grade and year levels when subjected to Fry and SMOG formulae?

3. Is there a difference between the target level and the readability level of the passages in English and Filipino?

4. What can be recommended as a result of the readability evaluation?

Language plays a significant role in understanding the content of academic books used in different subjects. When there is great discrepancy between the students' level of language proficiency and the language used in academic texts for the different content subjects, the students experience difficulty, and consequently, they struggle with the language barrier as they attempt to construct meaning. Most of the time, their attention is focused on addressing the language problems such that they fail to devote time on processing the textual content to arrive at meaning. As a result, they also fail to learn and master the content. Yet, when their linguistic and reading ability matches with the demand of the texts, they can focus more on the construction of meaning, as they allocate their cognitive resources toward attaining this goal.

Readability is one major determinant of one's reading as readers experience ease of comprehension because of style of writing. Readability describes the ease with which a document can be read (Hermosa, 2002). It is generally reported in terms of grade levels as an objective measure of the difficulty of a book or article. In the sense of language comprehensibility, the study of readability has a long history, rooted in Plato and Aristotle's classic rhetoric

alongside the ancient Hebrew scholars' vocabulary analyses of the Bible (Zakaluk & Samuels, 1990**).**

 Readability tests, which are mathematical formulas, were designed to assess the suitability of books for students at particular grade levels or ages. Readability formulas yield a numerical, quantitative score that is used to rank print materials in order of their difficulty, often expressed in the form of grade-level equivalents. Readability scores give information on the reading ability level of a student per educational year level (i.e. at the end of the school year, a grade 5 student must read texts for grade 5 at the independent level). It has been one major quantitative assessment since 1920s (Diane Lapp, James Flood, & Nancy Farnan 2008**).**

Since then, over 100 readability formulas have been currently available. In English, among several well-known formulas for measuring readability are the Fry Readability Formula, MacLaughlin's SMOG (Simple Measure of Gobbledygook) Test, the Flesch Reading Ease (FRE) formula and the Flesch-Kincaid Grade Level (FK) formula. These formulas have established text difficulty on the basis of syntactic and semantic complexity. According to Farstrup and Samuels (2002), semantic complexity is measured by either word familiarity, as compared with a particular list of words or by word difficulty, as measured by the number of syllables per word, while the number of words per sentence determines syntactic complexity. Back then, readability formulas were the guide for creation of texts, not simply the evaluation of text since the 1920s to the '80s.

For their part, Harris and Hodges (1995) assert that text variables such as format, typography, content, literary style, vocabulary difficulty, sentence complexity, concept load or density, and cohesiveness contribute to readability. Yet reader variables also affect readability, including motivation, abilities, background knowledge, and interests. Despite these reader variables, however, many formulas usually objectively estimate the level of materials based on selected and quantified variables in text, especially some index of vocabulary difficulty and sentence difficulty (Harris and Hodges, 1995).

Tompkins (2001) and Lapp, Flood, and Farnan (2008) aver that one fairly quick and simple readability formula is the Fry Readability Graph, developed by Edward Fry (1968). His formula depicts results on a graph identifying approximate grade level and providing difficult estimates over a wide range of reading levels, from primary through post college, or as Hermosa (2002) says, from grade one through graduate school.

Another readability formula is SMOG (Simple Measure of Gobbledygook) which was published by G. Harry McLaughlin as a more accurate and more easily calculated substitute for the Gunning-Fog Index, another readability formula intended for English passages. The calculation of text readability was determined by counting the words of three or more syllables in three 10-sentence samples, then estimating the square root of the number of counts (from the nearest perfect square), and finally adding 3.

METHODOLOGY

Primarily, the descriptive quantitative design of the study was used to establish the readability levels of English and Filipino passages from elementary and high school textbooks. A total of 548 sample passages were chosen (334 in English and 214 in Filipino) and were subjected to the SMOG and Fry readability formulae, which also served as the major evaluation instruments of the study. The sample passages were selected in accordance with the recommended steps of the formulae to get sample from beginning, middle, and last pages of the textbooks for Fry, and to get a total of 30 sentences from the same pages for SMOG. These were encoded and the internet-based programs of SMOG and Fry run to determine the readability level of the passages. The results were later tabulated and compared with the target level of the books.

RESULTS AND DISCUSSION

Evaluation Results of English Passages

Figure 1 summarizes the results of evaluation using the Fry

Readability formula. The results were widely distributed as the graph indicated, varying from 'long word' to 'higher' or 'lower by two or more levels'. About 6.01% of the passages indicated a match between the Fry level and the passage level. Nevertheless, the item 'no result' showed the highest percentage of 37.24%, followed by 'invalid result' at 11.71%.

This result could be due to several reasons. First, the Fry readability formula was perhaps not considered when the passages were written. There could have been other criteria taken into account in preparing the texts, such as typography, heading, illustrations, and other visual and representational supports for comprehension. These elements were noticeably present in the passages evaluated where writers deliberately provided such, yet they were insignificant as far as the readability formulas used were concerned. In this regard Gunning (2003) already recommended the blending of quantitative and qualitative factors in leveling the passages and books. Obviously, the qualitative factors were not a part or element of the Fry readability formula since it merely considered word syllables and sentence lengths. Equally, the use of English by second language speakers could be one factor that affected the result, since the writers could be depending on their first language as a resource as they use English. Because the first language of the writers was not of the same family or origin with that of English, there was stark difference in the results of the evaluation for leveling the materials and determining their difficulty.

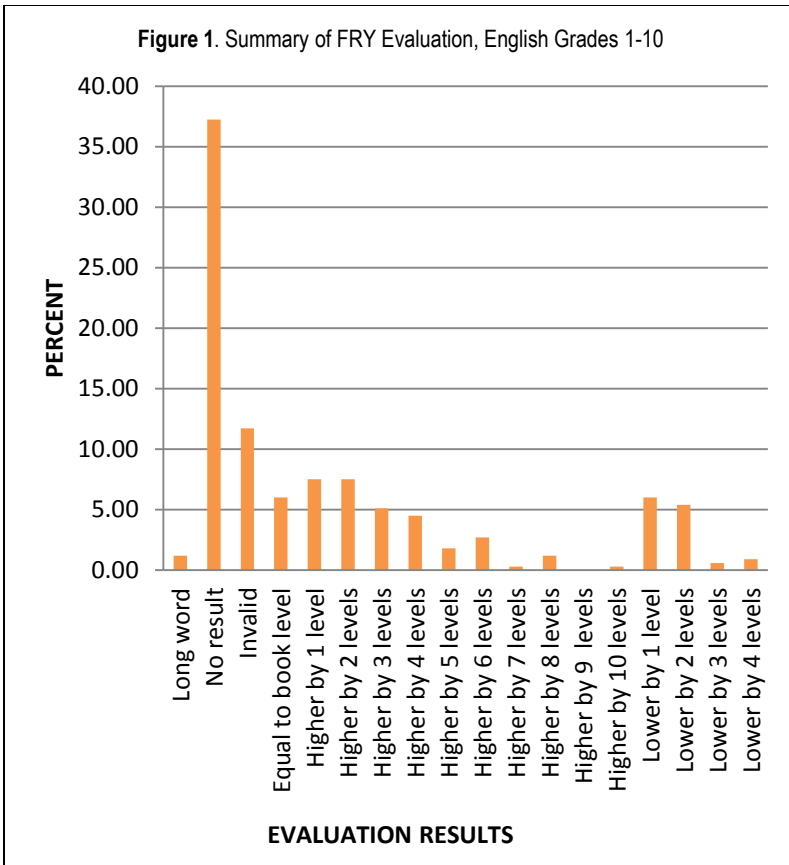Figure 1. Summary of FRY Evaluation, English Grades 1-10

Figure 2 shows the summary of SMOG evaluation results across grade levels. The result 'higher by 2 levels' got 16.82%, making it the highest among all the results. Expectedly, SMOG generally predicts at least two grades higher than Dale-Chall, as Hedman (2008) explains. This was followed by 'higher by 3 levels' at 15.62%, 'higher by 1 level' at 12.61%, and 'higher by 4 levels' at 11.41%. About 8.41% of the passages matched the book level.

Figure 2. Summary of SMOG Evaluation, English Grades 1-10
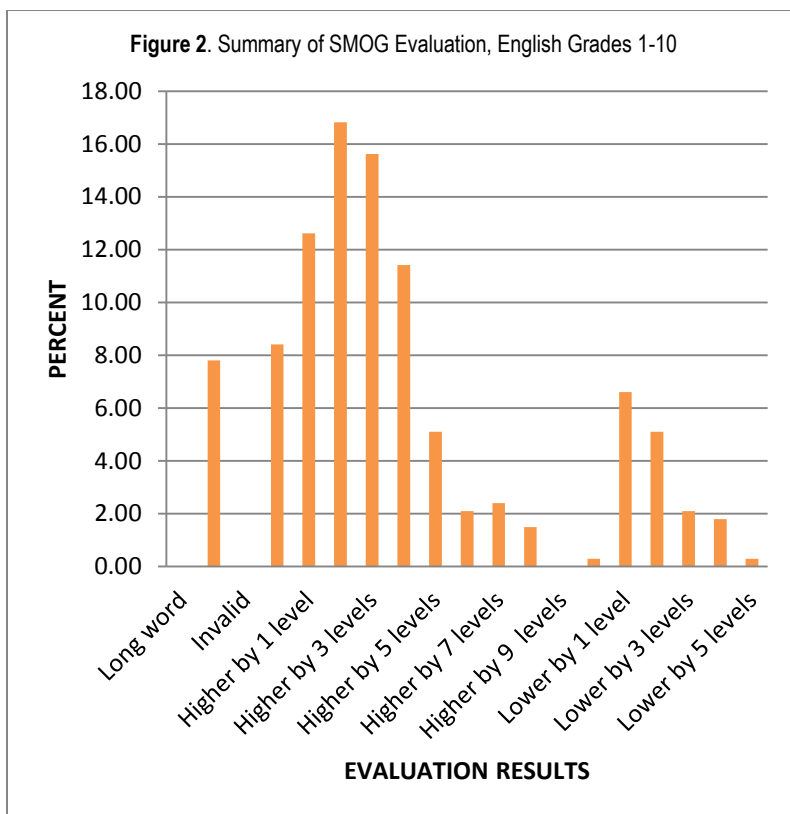
The result was also widely distributed, but it appears that the percentage of the highest evaluation result was not that far from the target level as Fry's. Comparably, evaluation indicating 'long word', ' no result', and 'invalid' did not show up in SMOG with the highest percentages, although the last two were the highest in the Fry readability evaluation results. Between the two formulae, SMOG readability formula seemed to yield results that were closer to the identified passage level. Also, the figure shows the wide distribution of results of the SMOG readability evaluation, ranging from 'no result' at 7.81% to 'lower by 5 levels' at .30%. As already mentioned, SMOG predicts that it yields results at least higher by two levels than Dale-Chall's. Perhaps SMOG could be a suitable formula for evaluating English passages written by Filipino authors when necessary adjustments are taken into account, such as increasing the number of polysyllabic words and sentence lengths per grade

level to accommodate the syntactic and semantic nature of the Filipino language. Perhaps some elements of the SMOG readability formula could be considered in developing a formula suitable to Filipino texts.

Evaluation Results of Filipino Texts

Figure 3 summarizes the results of evaluation made using the Fry readability formula. 'Invalid' and 'no result' got the highest percentages at 69.63% and 20.56% respectively, while 'long word' ranked third at 2.34%. This was not as diverse and widely distributed as the results of the English evaluation showed, but surprisingly, no result indicated 'equal to the book level'. The results strongly indicate that Fry could not be applied for Filipino texts perhaps because of the broad and extensive differences between English and Filipino stemming from their dissimilarity in roots, origin, and family

Undoubtedly, the bar graph below points to the idea of unsuitability, unacceptability, and unreliabillity of the Fry readability formula in matching the years of educational experience and difficulty level of texts written in Filipino with the target level of learners. The data imply a need for the development of a readability formula for texts written in Filipino as well as a warning to be cautious and discriminating in selecting a formula to guide the preparation and evaluation of passages and reading materials in Filipino..

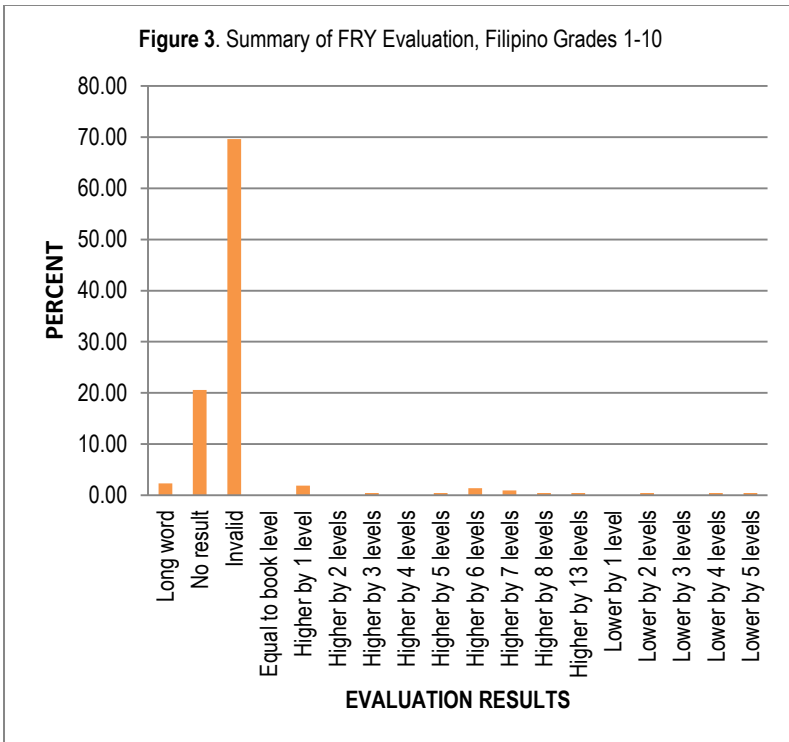**Figure 3**. Summary of FRY Evaluation, Filipino Grades 1-10

Figure 4 sums up the evaluation results using the SMOG readability formula for Filipino texts from grade 1 to 10. The results 'higher by six levels' got 16.82%, 'higher by 4 levels' with 10.75%, and 'higher by 5 levels' with 10.75%. There was no 'invalid' result, but there was 'long word' with 6.07%. Perhaps one adjustment on SMOG for Filipino texts would have something to do with how long words and complex sentences are counted and appreciated. Since there was no invalid result, the development of a formula for Filipino texts could probably use some SMOG elements for the matching of the two.

Figure 4. Summary of SMOG Evaluation, Filipino Grades 1-10
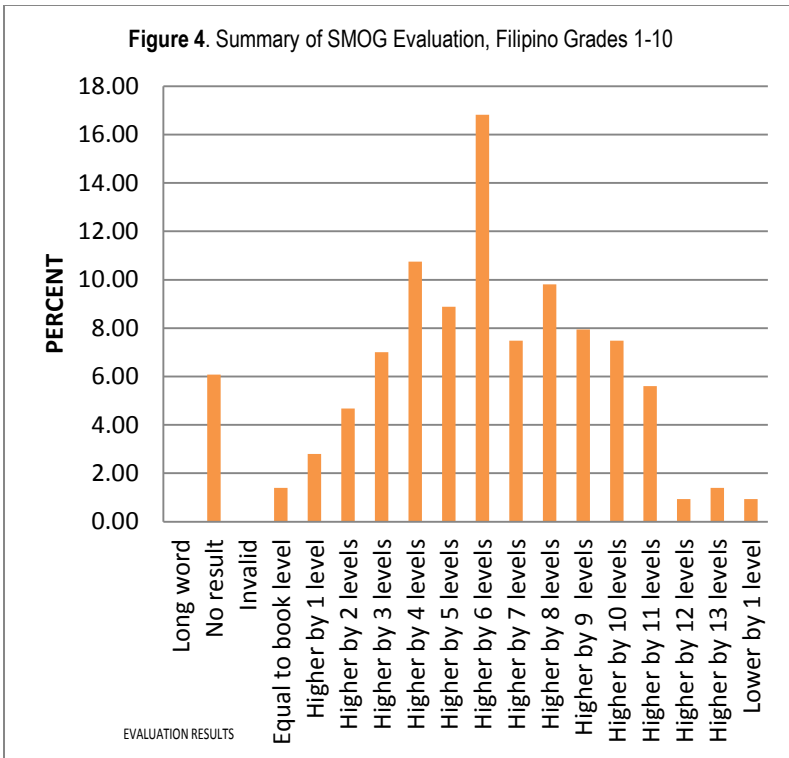
The wide dispersal of results ranging from 'no result' to 'higher' or 'lower' by several levels, with the peak or highest at 'higher by six levels' implies that applying a formula for a language other than what it intends for use could give misleading or flawed results. Consequently, the evaluation results could not be trusted not because of the formula itself, but due to the nature of the language to which it is applied.

In sum, the evaluation of readability levels using Fry and SMOG showed that:

1. the target levels of English passages from textbooks did not match the readability results of the two evaluation formulae;
2. the target levels of Filipino passages did not match the readability results of the two evaluation formulae, either;
3. the difference in the results of the two formulae with the target level of the majority of the passages varied from higher by two

or more levels.

CONCLUSIONS AND RECOMMENDATIONS

The use of readability formulae for a particular language yields invalid results when applied for another language in determining text difficulty and matching their results with the students' target levels and needs. There could be other factors or elements to consider other than what the readability formulae have included to ensure text comprehensibility of target readers. Furthermore, qualitative considerations of preparation and evaluation of passages could be taken into account to have more holistic criteria for evaluating books for use in public and private schools.

In light of the findings and conclusions drawn, the following are recommended:

1. Analyze the nature, characteristics, and origin of the Filipino language to have a strong grasp of its background as possible basis of a readability formula suitable and appropriate for Filipino texts.
2. Include qualitative criteria such as typography, illustrations, headings, captions and other considerations in preparing and evaluating sound and appropriate instructional materials other than the quantitative ones as guide for the development of a readability formula for Filipino texts.
3. Develop a readability formula appropriate for Filipino texts.

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