Readability of Reading Passages in the General Aptitude Test (GAT) and English Textbooks for the Upper Secondary Level in Thailand by Using Coh-Metrix

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ABSTRACT

This study aimed to compare the readability levels of the reading passages in the General Aptitude Test (GAT) and those of English textbooks for the Upper Secondary Level in Thailand. The corpus of the General Aptitude Tests (C-GAT) was compiled from 70 reading passages on GAT test papers from 2009-2021, and the corpus of English textbooks (C-ET) was compiled from 66 English textbook series. The data were quantitatively analyzed to investigate the readability levels of the reading passages in the two sets of corpora. The instrument of this study was Coh-Metrix - a common core text ease and readability assessor. The data were analyzed based on 11 categories of language characteristics divided into 106 indices. The results showed that the reading passages in the C-ET were easier than those in the C-GAT in 10 out of 11 categories with significant mean values in 4 categories: text easability principal component scores, referential cohesion, connectives, and word information. As a result, it can be concluded that the readability levels of the teaching and testing materials were incongruent. Thus, English textbook designers, English teachers, and test developers need to concentrate on the relationship among reading passages used in both national tests and English textbooks in order to achieve the right balance between students' English reading skills and results of the tests.

Keywords: readability, English textbooks, national tests, Coh-Metrix

Introduction

English textbooks are the main materials playing a crucial role in language teaching and learning (Rahmawati, 2018), especially for students who learn English as a Foreign Language (EFL). EFL students can practice English mostly and widely from the contents presented in textbooks (Dang & Seals, 2018). English textbooks establish the modules and learning methods, such as content, learning activities, learning sources, examples of language used, and tests (Parlindungan et al., 2018). They also exploit the potential to provide not only guidance for learning English but also a platform for cultural diversity introduced and cross-disciplinary knowledge integrated (Huang, 2019). English textbooks also have a tremendous impact on teachers' teaching behaviors such as introducing new content, revising and checking students' understanding and knowledge, and assigning activities or homework (Jukic & Glasnovic, 2020). Considering different aspects of language skills, many English textbooks are developed by containing the available contents and resources to increase the ability of students on particular language skills such as reading or focusing on other components of language such as vocabulary, grammar, and cultural issues (Faramarzi et al., 2021). Hence, English textbooks are considered to be one of the most important parts of language teaching and learning.

One of the important aspects of English textbooks is readability, as it provides a comprehensive picture of the difficulty level of a passage. Linguistic functions in reading texts can affect reading comprehension (Rimkeeratikul, 2022). Most of the previous studies on textbook analysis concern a lexical aspect and readability. For example, Anwar (2017) suggested that the lexical density of the texts appearing in English textbooks should not be too difficult to read and the understanding based on the students' reading ability. Ağçam and Babanoğlu (2018) argued that English textbooks had high lexical density and readability, and consisted of understanding texts with high readability levels and high lexical density. Meanwhile, Satriawan (2018) found that English textbooks contained different ratios of lexical density. Hidayatulloh (2019) agreed that the dominant level of lexical density is quite difficult, and lexical variation is low which means that English textbooks are quite easy to understand. Nguyen (2020) added that the majority of the reading passages consisted of novel words, and few words were important for text comprehension. In addition, Noviyenti (2021) concluded that most of the passages in English textbooks were categorized to be easily comprehended. As a result, readability is an important aspect that should be taken into account when deciding on materials to match the skill level of a text with its intended readers since it can identify how easy or difficult a text or passage is.

It is believed that English textbooks can deliberately construct to help students provide the appropriate lessons for students and improve their test results and textbooks have a relationship with student achievement (Li, 2014). Some researchers conducted studies to analyze reading passages in English textbooks compared to the tests. Wulan (2017) found that the reading texts embedded in English textbooks, were more difficult to understand than ones in the national examination based on the average score calculated by the Dale-Chall readability formula. In contrast, Mallipa and Murianty (2019) discovered that reading passages in English textbooks did not give enough opportunities for students to exercise their knowledge and skills for the national test. Gashaye and Girma (2020) added that the reading passages in English textbooks needed to be full of interestingness, authenticity, and sufficient vocabulary to enhance the students' reading ability for the tests. In the Thai context, it was found that the studies on readability rarely compared English teaching textbooks with testing items in order to find the difficulty of passages (Srisunakrua & Chumworatayee, 2019).

Due to some pressure from other stakeholders in educational settings, the teachers tended to concentrate on the tests (Imsa-ard, 2020). The English language achievement test was used to assess students' performance in English Language and was adopted for undergraduates studying English and Linguistics. The General Aptitude Test (GAT) is one of the national achievement tests that has been used as one of the testing instruments of the Thai University Central Admission System (TCAS) since 2010. It is divided into two parts focusing on critical and logical thinking,

and English communication. In the English component, multiple choice test items are included in the GAT to measure Thai students' English language skills. Since the national test called Ordinary National Educational Test (O-NET) has been canceled in 2021, a student's GAT result becomes a more important part of the Central University Admissions System (CUAS) in terms of applying its result to the entrance examination after students have graduated from the upper secondary level.

The mean scores for the English component of the GAT in 2010-2021 were 49.96 points out of 150 points, which has the percentage of average score at only 33.31% (National Institute of Educational Testing Service, 2022) (see Appendix I). From the test results, Srisunakrua (2018) suggested that the readability levels of both the testing and teaching materials were not balanced. As a result, a national test should reflect what contents that have been taught in class and the common core standard (Nipakornkitti & Adunyarittigun, 2018). The very low result of the English proficiency test of Thais might be caused by their low reading skills Srisunakrua (2018). The new generation of Thai students are afraid of speaking English and cannot concentrate on long-time reading task; moreover, the Thai educational system in English language teaching focuses on correctness and memorization instead of communication (Nipakornkitti & Adunyarittigun, 2018).

It can be seen that the GAT has become influential as a national test for Thai students, and English textbooks are considered an important tool in teaching and learning English along with materials and activities. To date, research studies on the readability level that have been conducted to compare reading passages in textbooks with those in the tests are still limited in Thailand (Srisunakrua & Chumworatayee, 2019). To fill in the research gap, this study focuses on comparing the readability levels of the reading passages in the GAT and those of English textbooks for the upper secondary level in Thailand. This study aims to address the research question: What are the readability levels of the reading passages in the GAT and those of English textbooks certified by the Office of the Basic Education Commission (OBEC) in Thailand?

Literature Review

Readability

One crucial aspect of the English language teaching is readability, as it gives a comprehensive image of the difficulty level of a passage, particularly in the context of testing. Zamanian and Heydari (2012) noted that readability is the ease with which a text can be read with understanding. Readability could be determined if any given written text is written clearly and at a comprehensible level (Ebrahim & Roghayeh, 2017). Srisunakrua and Chumworatayee (2019) defined readability as a tool that can be described as a measure of the projected text difficulty, which can be calculated using a variety of different readability formulas. Rami and Abdalla (2020) stated that readability refers to the ease of written texts or contents that can be easily read and comprehended. In short, readability can identify how easy or difficult a text or passage is. It can be assumed whether the reading passage is easy to read or not by measuring readability.

According to Apairach (2023), EFL learners tend to experience a certain level of difficulty when dealing with different types of reading texts. As a result, readability should be taken into account when deciding on materials to match the skill level of a text with its intended readers. Gopal et al. (2021) proposed that readability focuses on the text and the reader; therefore, an achievement in the reading of a person depends on the understanding level of the reading passage. Similarly, Lendo et al. (2021) added that a high readability level will ease reading attempt and speed for a reader, but it is a large difference compared to those who have a low level of reading comprehension according to readability levels.

To measure the readability level of a text, analyzing the writer's usage of numerous compositional elements that either facilitate or impede text understanding is important. Therefore, there are many readability formulas that were developed to seek the best approach to identifying the readability level or difficulty of the reading text. However, most readability formulas cannot analyze and interpret deeper variables beyond the word and sentence level (Srisunakrua, 2018).

Since the limitation of using the readability formulas was found, there should be a modern formula or accessor to analyze readability in general variables and deeper features than only at the basic level of the text – the number of words and sentences. As a result, this study was conducted by using a tool for measuring readability called Coh-Metrix.

Coh-Metrix

Coh-Metrix is considered as one of the automated tools for measuring the readability level of a targeted text in a passage with original purposes that to provide various automated analyses using multiple language features. It allows those who are interested in measuring readability levels, such as readers, writers, educators, and researchers to rapidly determine the reading level of any given text sample (McNamara & Kintsch, 2009).

Coh-Metrix was introduced to assess written texts based on several attributes and discourse levels. The original motivation for creating Coh-Metrix was to construct an automated text cohesiveness metric. Cohesiveness was interesting to be focused on since understanding is affected by compelling connections between the cohesion of texts, background knowledge of the topic of readers, and readers' overall comprehension abilities (McNamara & Kintsch, 2009). Cohesion can support the comprehension of most texts by the majority of readers, but under certain circumstances, writings with poorer cohesion encourage more experienced readers to develop better conclusions and essential explanations. Although cohesiveness was the main impetus for the development of Coh-Metrix, it identified the necessity to evaluate texts at different language-discourse levels.

The measurements suggested by multilevel theoretical frameworks that make up Coh-Metrix are with the numerous language-discourse levels (Graesser & McNamara, 2011). The representations, structures, strategies, and processes are all defined by the theoretical frameworks on different levels of language and discourse. Coh-Metrix emphasizes linguistic characteristics that have been strongly linked to a higher understanding level of texts than those that are related to a surface of reading components. There are 11 Coh-Metrix's categories employed in this study which affect the readability levels of the text as follows.

Descriptive

Unaka et al. (2017) claimed that the distribution of readability, understandability, and completeness of written discharge instructions was enumerated using descriptive statistics. Coh-Metrix offers descriptive indices to assist the user in both verifying the Coh-Metrix output and interpreting data patterns. The number of words, syllables, and letters in words, including the number of sentences, and paragraphs are considered as descriptive measure.

Text Easability Principal Component

These elements produce a greater understanding of the text ease (and difficulty) that results from the linguistic features of texts. Co-Metrix can analyze text's narrativity, syntactic simplicity, word concreteness, referential cohesion, deep cohesion, verb cohesion, connectivity, and temporality. Srisunakrua and Chumworatayee (2019) indicated that easability components based on the linguistic features of the reading text can provide a clearer image of text difficulty.

Referential Cohesion

Referential cohesion, also known as co-reference, describes the overlap of content terms between local sentences. It is a linguistic indication that can help readers grasp the relationships between phrases, sentences, and propositions in a text. Noun overlap, argument overlap, stem overlap, content word overlap, and anaphor overlap are provided as Coh-Metrix's co-reference

measures. Because of established connections between concepts, highly coherent texts are often easier to read and interpret (McNamara & Graesser, 2012)

Latent Semantic

Measures of semantic overlap between phrases or paragraphs are provided by latent semantic category analyzed by Coh-Metrix. It can measure the sentence adjacent by comparing how conceptually similar each sentence connected to the next sentence. Latent semantic analysis can criticize similar terms appearing in the comparable text. Srisunakrua (2018) described that it can be challenging for readers to understand a reading passage if they are inquired to draw many conclusions from what they read based on too many mislaid details.

Lexical Diversity

Lexical diversity is defined as the range of distinct word types that are present in a text relative to the total number of words. When the total number of words and the number of word kinds are equal, all of the words are distinct. The text is likely to be quite brief or have very little cohesiveness in that situation, and lexical variety is at its highest level. Wood et al. (2018) believed that students' reading proficiency improves as their word-level decoding and comprehension skills, which are impacted by vocabulary knowledge development.

Connectives

Connectives are crucial for establishing strong relationships between concepts and clauses and offer information about how a document should be organized (Cain & Nash, 2011). Crossley et al. (2019) found that text cohesion characteristics revealed that passages with less paragraph-level lexical overlap and fewer temporal connectives were more challenging to understand.

Situation Model

The expression situation refers to the level of mental representation for a text that involves much more than the explicit words (Graesser & McNamara, 2011). It involves the aspects of mental representation that are present when a certain context is active. Coh-Metrix analyzes the situation model in 5 dimensions: causation, intentionality, time, space, and protagonists. If too many words are in a text and readers have to make too many assumptions, it will be hard to understand the text.

Syntactic Complexity

Syntactic complexity refers to the range and complexity of language forms in the language output. Coh-Metrix can scale texts based on syntax features: shorter sentences, fewer words per noun phase, fewer words before the main verb, and fewer logic-based terms. It computes two additional syntactic measures: passive voice frequency (Boghrati et al., 2018), which is harder to comprehend than active voice, and syntactic similarity, which raises reading speed and understanding.

Syntactic Pattern Density

The density of specific syntactic patterns, word types, and phrase types, also affects syntactic complexity. In particular when compared to other elements in a text, it is believed that the relative density of each of these would influence how difficult it is to understand text (McNamara et al., 2014). Coh-Metrix can measure the incidence of noun phrases, verb phrases, adverbial phrases, and prepositions. In particular, when compared to other components of a text,

it can be anticipated that the relative density of each of these will influence how difficult it is to reading passages.

Word Information

The concept of word information showed that each word has a certain syntactic part-of-speech category; thus, syntactic categories are divided into content words and function words. Coh-Metrix can analyze a part-of-speech category for each word based on syntactic context (Chon & Shin, 2020). Coh-Metrix also calculates the word in relative frequency type including syntactic and semantic categories by analyzing the number of occurrences per 1,000 words of text.

Readability

The standard approach of determining a text's level of difficulty uses a number of readability calculations. Many readability formulas that were developed to seek the best approach to identifying the readability level or difficulty of the reading text. In EFL and ESL contexts, Flesch Reading Ease and Flesch-Kincaid Grade Level formula are the most well-established. Flesch Reading Ease is considered as one of the most reliable readability formulas used. Created in 1948 by Rudolph Flesch, it has become a common readability metric for the US Department of Defense and other US Government Agencies and applied in measuring how difficult an English-language reading passage is. To determine the reader's grade level of the passage, a point scale between 0–100 shows how difficult a passage could be; the easier to understand a text is, the higher score of readability it is calculated. In addition, the Flesch-Kincaid Grade Level is the improved formula of Flesch Reading Ease. Created and upgraded by Rudolph Flesch, with his supporter John P. Kincaid, this formula can calculate the average number of syllables per word and the average number of words per sentence.

Related Studies

There have been previous studies attempting to examine the readability levels of textbooks in comparison with that of the tests. For example, Lee and Kang (2021) analyzed the text difficulty of senior high school English textbooks in South Korea and compared them with the college scholastic ability test (CSAT) by using Coh-Metrix. The result showed that textbooks and the CSAT had statistically more significant differences in ten of thirteen variables not found in syntactic complexity and semantic cohesion. As a result, the students whose studies were based on the school curriculum and relied on using textbooks would struggle with the CSAT. To normalize public education along with relieving the stress in learning, textbooks and the CSAT should be balanced. Another study by Cheng and Chang (2022) examined the readability levels of senior high school English textbooks in Taiwan compared to those in the tests. The vocabulary and readability level of passages were analyzed by Coh-Metrix. The results revealed that the readability levels of the reading passages in the tests were not balanced with those in English textbooks. Reading passages in English examinations were typically less readable, less narrative, and more syntactically complicated than those in textbooks. In addition, passages in the tests found far contained more difficult vocabulary than in the textbooks.

In the Thai context, Srisunakrua (2018) investigated the readability of reading passages in English textbooks used in Thailand and the ONET – Thai National English test by comparing the difficulty of the English textbooks and Thai national English tests to measure the readability level in overall by using Coh-Metrix along with analyzing the topic areas. The results revealed that the corpus of the reading passages in the English textbooks are typically found easier with contained simple linguistic characteristics, whereas the O-NET tests were more difficult. In terms of the topic of contents in both two corpora, it was determined that there were dissimilarities between those in the English textbooks and the examinations. As a result, it appears that the students might

have been taught using reading materials that had less demanding linguistic characteristics while being tested with greater complexity.

In summary, it can be seen that reading is very important for academic achievement, and the readability levels of textbooks and tests should be related. From a review of the literature, there is a scarcity of research studies that compare the difficulty of textbooks and tests in the Thai context. Therefore, a study on the readability of reading passages in the General Aptitude Test (GAT) and English textbooks in Thailand for the upper secondary level by using Coh-Metrix will ensure that reading passages both in textbooks and tests could be conveyed effectively to the students who will utilize them.

Methodology

Research Design

The quantitative research method was employed to investigate and compare the readability levels of the reading passages in the General Aptitude Tests (GAT) and those in the English textbooks prescribed and certified by OBEC for the upper secondary school level in Thailand. The obtained data will be quantitatively analyzed to investigate the readability levels of the reading passages in the GAT and the English textbooks and to compare the two sets of the compiled corpora: the corpus of the General Aptitude Tests (C-GAT) and the corpus of English textbooks (C-ET). Quantitative corpus analysis involved the frequency counts of linguistic features of both the C-GAT and the C-ET.

Research Instrument

This study employed Coh-Metrix as a research instrument. Coh-Metrix, developed by Graesser, McNamara, Cai, et al. (2014), is a common core text ease and readability analyzer and assessor – a tool created and designed to analyze the readability of text input. It provides useful information about text features and can be also accessed freely via the website address http://141.225.61.35/cohmetrix2017. The majority of current readability measures were entirely based on two characteristics of text: the difficulty of the sentences, which is typically measured in terms of both the number of words and word family including clauses per sentence, which is typically measured in terms of their frequency in a large database of texts. Each of these automated components score can reveal how difficult a reading text is.

Building Corpora

Two sets of corpora compiled were built, which include (1) the C-GAT, the corpus of reading passages in the General Aptitude Tests (GAT), and (2) the C-ET, the corpus of reading passages in the English textbooks used in Thailand and certified by the OBEC.

The C-GAT was built from collecting the reading passages in the General Aptitude Tests (GAT) starting from the first exam held in 2009 to 2021 (13 academic years). Every reading passage in the tests was in the range of 107–464 words. To compile the C-GAT, the token was collected from the minimum to maximum number of words in the passages on the test paper from 2009–2021. The 23 issues of the GAT test paper including 70 reading passages used in this study are shown in Table 1 below.

Table 1

Corpus of Reading Passages in the General Aptitude Tests (C-GAT)

Academic year	Issue	The number of words in the passages for each issue (Token)			
		Passage 1	Passage 2	Passage 3	Passage 4
2009	1st Issue	282	178	-	-
	2nd Issue	169	277	-	-
	3rd Issue	436	323	-	-
2010	1st Issue	208	207	333	-
	2nd Issue	237	290	375	-
2011	1st Issue	191	464	217	-
	2nd Issue	280	311	378	-
2012	1st Issue	285	349	323	-
	2nd Issue	287	370	297	-
2013	1st Issue	146	133	354	-
	2nd Issue	203	266	-	-
2014	1st Issue	117	107	156	216
	2nd Issue	166	189	163	189
2015	1st Issue	307	252	350	217
	2nd Issue	147	192	198	278
2016	1st Issue	168	168	207	-
	2nd Issue	221	222	240	384
2017	1st Issue	294	270	303	-
	2nd Issue	330	204	333	-
2018	1st Issue	166	240	129	-
2019	1st Issue	208	215	206	-
2020	1st Issue	191	208	222	-
2021	1st Issue	163	226	234	-
Total		70 passages			

Corpus of Reading passages in the English Textbooks (C-ET) were built by compiling the reading passages in the 66 English textbooks that were both applied in the fundamental English and additional reading courses for the upper secondary school level in Thailand. To make C-ET concise, this study deleted all accompanied pictures and illustrations, tables, figures, graphs, etc. The poems, text signs, and text on advertisements were also excluded. To provide valid data, 662 reading passages that ranged in length from 107 to 464 words were compiled in the corpus based on the minimum to maximum number of words in the passages of C-GAT compiled.

The names of all English textbook series certified by the OBEC in the academic year 2021 and the number of reading passages compiled are listed in Table 2 below.

Table 2

The List of English Textbooks Certified and the Number of Reading Passages Compiled

No.	Name of Textbook Series	The Number of Reading Passages for each Issue (107–464 words/a passage)		
		Grade 10	Grade 11	Grade 12
1	Aim High	7	7	7
2	Ellevate English Reading and Writing	12	12	12
3	Flash on English	6	6	6
4	Focus	8	8	8
5	Go Beyond	10	10	10
6	Impact	8	8	8
7	Inspired	8	8	8
8	Mastery in Reading	20	20	20

9	Moving Up Critical Reading	20	20	20
10	New Frontier	8	8	8
11	New Weaving It Together	11	-	-
12	New World	7	8	10
13	Progress in Reading & Writing Book	20	19	17
14	Project Explore	6	6	6
15	Reading Adventure	16	16	16
16	Reading the World Now	-	-	-
17	Student for Peace	8	8	8
18	Success	10	10	10
19	Upload	19	24	32
20	Upstream	8	8	8
21	Wise Up in Reading and Writing	9	2	1
22	World Club	6	6	6
	Total		662 Passages	

Data Analysis

In order to obtain the data on the average readability levels of the reading passages compiled in both C-GAT and C-ET corpora. The C-GAT and C-ET will be analyzed quantitatively by using Coh-Metrix. The results of the study were analyzed according to 11 categories (106 indices): descriptive, text easability principal component scores, referential cohesion, latent semantic analysis, lexical diversity, connectives, situation model, syntactic complexity, syntactic pattern density, word information, and readability (see Appendix II).

The average readability levels of the reading passages embedded in both C-GAT and C-ET were calculated based on Flesch Reading Ease, Flesch-Kincaid Grade Level, and Coh-Metrix L2 Readability using the mean score (M) and standard deviation (SD) of the three indices. The results from Coh-Metrix were interpreted into difficult values, and each index was compared based on the Coh-Metrix Indices Norms by Touchstone Applied Science Associates (TASA) Incorporated (McNamara et al., 2014) to find out which one is easier.

Results

To answer the research question, the results are shown based on the 10 characteristic categories and three readability indices: Flesch Reading Ease, Flesch-Kincaid Grade Level, and Coh-Metrix L2 Readability of the C-GAT compared with the C-ET analyzed by Coh-Merix. The results were shown in Table 3, and Table 4 as follows.

Table 3

Comparison between C-GAT and C-ET by Coh-Metrix's Categories

Index	C-GAT		C-ET		t	Interpretation	Result
	Mean	SD	Mean	SD			
Category 1 Descriptive							
2, 3, 4, 6, 7, 8, 9, 10, 11	48.412	15.284	54.764	14.951	-1.061	Lower =easier	C-GAT is easier.
Category 2 Text Easability Principal Component Scores							
12, 13, 14, 15, 18, 19, 22, 23, 24, 25, 26, 27	15.189	12.145	21.480	4.925	-2.824*	Higher =easier	C-ET is easier.
16, 17, 20, 21	34.031	13.503	32.617	2.823	1.046	Lower =easier	C-ET is easier.
Category 3 Referential Cohesion							
28, 29, 30, 31, 32, 33	0.413	0.207	0.332	0.085	6.338*	Lower =easier	C-ET is easier.

Index	C-GAT Mean	SD	C-ET Mean	SD	t	Interpretation	Result
34, 35, 36, 37	0.079	0.032	0.095	0.011	-4.788*	Higher =easier	C-ET is easier.
Category 4 Latent Semantic Analysis							
38, 40, 45	0.171	0.070	0.167	0.040	2.774	Lower =easier	C-ET is easier.
39, 41, 44	0.192	0.054	0.210	0.033	-3.521	Higher =easier	C-ET is easier.
Category 5 Lexical Diversity							
46, 47, 48, 49	56.222	17.279	44.149	3.383	1.720	Lower =easier	C-ET is easier.

Note: * Significant (.05)

Table 3

Comparison between C-GAT and C-ET by Coh-Metrix's Categories (Cont.)

Index	C-GAT		C-ET		t	Interpretation	Result
	Mean	SD	Mean	SD			
Category 6 Connectives							
51, 52, 53, 54, 55, 56, 57, 58	28.707	3.188	27.451	10.292	2.037*	Lower =easier	C-ET is easier.
Category 7 Situation Model							
59, 60, 61, 65, 66	17.381	6.966	22.455	2.406	-2.454	Higher =easier	C-ET is easier.
62, 63, 64	0.469	0.363	0.406	0.044	0.788	Lower =easier	C-ET is easier.
Category 8 Syntactic Complexity							
67, 68	2.913	1.037	2.116	0.496	1.132	Lower =easier	C-ET is easier.
69, 70, 71, 72, 73	0.525	0.034	0.538	0.010	-1.166	Higher =easier	C-ET is easier.
Category 9 Syntactic Pattern Density							
74, 77, 78, 80	126.833	19.579	123.280	6.785	1.068	Lower =easier	C-ET is easier.
75, 76, 79, 81	65.544	17.710	67.698	4.447	-1.192	Higher =easier	C-ET is easier.
Category 10 Word Information							
82, 84, 91, 95, 101, 103	122.945	20.737	113.436	8.402	1.830	Lower =easier	C-ET is easier.
83, 85, 86, 87, 88, 89, 90, 92, 93, 94, 96, 97, 98, 99, 100, 102	130.898	13.632	135.100	7.301	-2.780*	Higher =easier	C-ET is easier.

Note: * Significant (.05)

Table 3 illustrates the results based on 10 categories of the language characteristics of the reading passages on the C-GAT compared with the C-ET analyzed by Coh-Metrix. The results showed that the passages in the C-GAT are easier than those in the C-ET with significant differences in the average mean values in the descriptive category (M = 48.412, SD = 15.284 < M = 54.764, SD = 14.951).

However, the results of the other 9 categories revealed that the passages in the C-ET are easier than those in C-GAT. The results showed significant differences in the average mean values analyzed by the Coh-Metrix in Category 2: text easability principal component scores (M = 21.480, SD = 4.925 > M = 15.189, SD = 12.145), Category 3: referential cohesion (M = 0.332, SD = 0.085 < M = 0.413, SD = 0.207, and M = 0.095, SD = 0.011 > M = 0.079, SD = 0.032), Category 6:

connectives (M = 27.451, SD = 10.292 < M = 28.707, SD = 3.188), and Category 10 word information (M = 135.100, SD = 7.3011 > M = 130.898, SD = 13.632).

Table 4

Comparison between the C-GAT and the C-ET by Coh-Metrix's Readability Category

Index	C-GAT		C-ET		Interpret ation	Results	
	Mean	SD	Mean	SD		C-GAT Easier	C-ET Easier
Category 11 Readability							
103. Flesch Reading Ease	55.994	12.637	<u>72.482</u>	6.488	Higher value = easier		✓
104. Flesch-Kincaid Grade Level	10.092	2.570	<u>6.546</u>	1.031	Lower value = easier		✓
105. Coh-Metrix L2 Readability	12.340	5.009	<u>18.531</u>	4.052	Higher value = easier		✓

From Table 4, the results of readability category showed that the passages from the C-ET are easier than those in the C-GAT in terms of Flesch Reading Ease (M = 72.482, SD = 6.488 > M = 55.994, SD = 12.637), Flesch-Kincaid Grade Level (M = 6.546, SD = 1.031 < M = 10.092, SD = 2.570), and Coh-Metrix L2 Readability (M = 18.531, SD = 4.052 > M = 12.340, SD = 5.009).

Discussion and Conclusion

According to the results analyzed by 11 categories, the reading passages in the C-ET were easier than the reading passages in the C-GAT. This can be concluded that the readability levels of the teaching and testing materials were incongruent. In other words, the English textbooks certified by OBEC introduced, used, or applied with upper secondary school students in Thailand were easy, meanwhile, the national English tests were a lot more difficult than what they had been taught in class based on 11 categories of the language characteristics as follows.

Descriptive

Even though the average number of words, the total number of words in sentences, and sentences in each paragraph in the C-ET are higher than those in the C-GAT, the average number of letters, words, word length, syllables, and all of the words in the texts in each sentence in the C-ET are lower than those in the C-GAT. The results are in line with a previous study by Keith et al. (2014) that some characteristics of the English textbooks found significantly higher readability levels than the mean of those in the national tests' readability levels in the descriptive category. It can be concluded that the number of letters in word length, words, and syllables used in the C-GAT is more difficult compared to those in the C-ET. It also may be interpreted that passages in the English textbooks present more narrative detail and information (Abdollahi-Guilani, 2022), meanwhile, those in the GAT contain more brief and concise information.

Text Easability Principal Component Scores

The results show that word concreteness, referential cohesion, syntactic simplicity, narrativity, and deep cohesion of the passages in the C-ET are easier, using easy-to-read-and-understand passages, narrativity, and very story-like words. They lack the number of clauses per sentence, words before the main verb in the main clause compared. This supports a previous study by Odo (2018) finding that most of the texts in the tests must lack simple-to-understand

characteristics. Many words must be concrete words that can be easily sensed, helping a reader make connections between ideas because sentences and paragraphs use similar words or concepts. Moreover, the types of words used in English textbooks to link sections of the text can be conveyed some ideas, information, and events easily compared to those in the C-GAT. Based on a previous study by Mirshojaee and Sahragard (2015), the portions in the tests are likely to have more informational texts in the reading passages, as is obvious from the interpretation.

Referential Cohesion

The results reveal that the C-ET appears more frequently than the C-GAT because of the precisely repeated words, which strengthen the passages' coherence and could render it easier for students to understand. It can be summarized that reading passages of the C-ET exhibit evidence of showing an easier readability level in all pairs of the referential cohesion compared to the C-GAT. This relates to a previous study by McCarthy et al. (2019) that cohesion indices were higher for formative texts than for narrative texts. Those words in the C-ET have nouns, stems, and content word overlapping much more found in the C-GAT and appear often in the reading passages to serve as linguistic clues, helping the reader in understanding the explicit relationship between clauses and sentences. The use of pronouns in both the C-ET and the C-GAT is the most frequent evidence that there were the relations within passages and helps students construct explicit cohesion in understanding.

Latent Semantic Analysis (LSA)

The results show that the latent semantic analysis (LSA) of English textbooks in the C-ET is lower than those in the C-GAT, which can be assumed that words used in the English textbooks are close to, or have similar meanings to those contained in the texts. It can be implied that the meaning of words in the C-ET is close to many words of human language learning and is easier to comprehend. When analyzing relationships between passages of the G-GAT and the terms, they produce higher LAS levels by creating a set of concepts associated with the passages where rare words are given a higher weight to reflect their relative importance. The results of the study are consistent with a study by Hanifah et al. (2022) that the vast majority of the reading texts did not reach the required degree of readability level that was appropriate for the learners who intended to read them.

Lexical Diversity

The passages in the C-GAT contain a wide range of words, causing a student or a reader to read, understand, and integrate new information and deep detail making the text harder to understand at the discourse level to extract definitions and the discourse level, while the C-ET has less lexical diversity and has a higher record of word repetition than the C-GAT. This relates to a previous study by Gizatulina et al. (2020) that reading passages are developed and launched to support students' competency. In addition, more often occurring words in English textbooks can support the passages' use of clear coherent relationships. In contrast to the C-GAT, the majority of the sentences in the passages of the C-ET are more connected by these local cohesive terms, simplifying the comprehension processing.

Connectives

Easier passages than those on the GAT can be found in English textbooks because the text base contains some data that are not explicitly specified in the text such as certain inferences, associative elaborations, and macro-propositions. Reading passages in the GAT are typically less readable, less narrative, and more syntactically complicated than those in English textbooks. The national tests varied greatly in relation to the reading passages' level of difficulty (Liao, 2020).

Reading passages in the C-ET are easier, so less effort is required to read passages in the C-GAT since a reader is able to link each idea of words in English textbooks faster than in the GAT. Each text element is connected by explicit connectives, which can improve text coherence and enhance improving comprehension. Hence, the textual difficulty is higher when propositions lack cohesiveness. In addition, all connectives, logical connectives, and additive connectives in C-GAT are integrally related, meanwhile, the C-ET seems relevant among the expanded temporal connectives and causal connectives.

Situation Model

In the situation model, the passages in English textbooks consist of characters that are quite relevant to the main idea and some details, while the passages in the C-GAT have missing words thus making the readers to draw many assumptions to comprehend the concept within. On the other hand, more causal and purposeful verbs were used than in the C-ET, which forms the basis for the development of the situational model of reading. Causal verbs in the C-ET are more frequently used in narrative texts than in informative passages in the C-GAT. The results are relevant to a previous study by Cheng and Chang (2022) that the reading passages in English textbooks are unbalanced compared with those on the tests. In summary, the intentional verbs are more frequently recorded in reading passages in the C-GAT, so it can be concluded that the reading passages in the C-ET are more informative.

Syntactic Complexity

In comparison to the C-GAT, the results show that the C-ET has a simpler syntactic structure. This is in line with a previous study by Lee and Kang (2021) that had statistically significant differences in variables between syntactic complexity and semantic cohesion assessed in the textbooks and tests. The passages in English textbooks had shorter sentences, fewer words per noun phase, fewer words before the main verb, and fewer logic-based terms that could cut down on the amount of time needed for understanding. Additionally, the paragraphs in the C-ET had more consistently constructed sentences, which made it simpler for readers to understand the texts. In a previous study by Hakim et al. (2021), it is found that a significant number of sections in English textbooks are written at levels below students' reading ability, providing them with input that they can comprehend. Besides, the passages in the C-GAT have additional syntactic measures: passive voice frequency, which is harder to comprehend than active voice, and syntactic similarity, which raises reading speed and understanding.

Syntactic Pattern Density

Syntactic pattern density can influence the text's processing difficulties. In the C-ET, adverbial and prepositional phrases, gerund density of syntactic pattern density, and agentless passive voice analyzed by Coh-Metrix demonstrate the simpler portions than C-GAT's, containing more of the syntactic and grammatical patterns. However, for the C-GAT, only two syntactic patterns, noun phrases, and infinitives, which were more prevalent in the easier reading sections, were found in the significant results. It is also found that passages in the C-ET are based on syntax features: shorter sentences, fewer words per noun phase, fewer words before the main verb, and fewer logic-based terms compared to the C-GAT. This supports a previous study by Ryu and Jeon (2020) that there was statistical significance in syntactic density indicating that the text difficulty for the English textbooks was well-organized for English language students.

Word Information

Regarding word information, the C-ET is more easily identifiable. For parts of the speech, the C-ET composed of nouns, pronouns, adjectives, and adverbs has been more often found

compared with the C-GAT. According to this interpretation, the C-ET employs these words more frequently than the C-GAT, which only shows indications of using second-person pronouns and third-person plural pronouns more frequently. It is possible to infer that the content in the C-ET passages employs more pronouns than the C-GAT, particularly first-person singular pronouns (I and we). This is in line with a previous study by Ryu and Jeon (2020) that second and third-person pronouns, additive connectives, lexical diversity, and density were substantial differences. The passages in the C-ET were acknowledged as simply linguistic features that could identify the narrative elements of the reading passages compared to the C-GAT.

Readability

The three readability formulas; Flesch Reading Ease, Flesch Kincaid Grade Level, and Coh-Metrix L2 Readability indicate that the reading passages in the C-ET were significantly easier than those in the C-GAT. This leads to the conclusion that the reading levels of the educational resources and testing tools were incongruous. It appeared that the tests were significantly higher level compared to the teaching materials that were introduced, used, or applied in class. This can support a previous study by Uri and Abd (2018) that the level of difficulty for the English exam selections was not appropriate for high school students.

Implications of the Study

The results of the study reveal that the readability level based on the language characteristics of the reading passages in the C-ET and the C-GAT are very distinct from one another. These incongruent outcomes affect all of the stakeholders, particularly English textbook designers, English language teachers, and test developers. As a result, some instructional implications are described below.

Implications for English Textbook Designers

The main finding concerning pedagogical implications is that English textbooks used and applied in classrooms in Thailand should be revisited by English textbook designers. To increase the readability level of reading passages in English textbooks, they should be more challenging by containing abstract words, syllables, and letters in all word lengths that are suitable for high levels of the national tests and make the passages in the English textbooks more concise and informative. Moreover, words in the passages in the English textbooks should be more connected with some academic ideas and information than general narrative texts.

By focusing on the Latent Semantic Analysis (LSA) and cohesive, the number of words that are precisely repeated across a passage weakens the piece's coherence and therefore should be reduced in English textbooks, to improve students' reading comprehension based on the higher levels along with those for Grades 10 – 12. It should be also most frequently employed to describe the ratio of content words (nouns, verbs, adjectives, and often adverbs) to the total number of words.

A passage in English textbooks should contain more words or phrases that are used to link separate clauses or sentences together. It should consist of three different types of connectives: conjunctions, prepositions, and adverbs. Connectives should be often used in a wide diversity of shapes as a connection that holds the reading passage together, allowing words in the passage to flow and connect without appearing errors. In addition, a passage in an English textbook should construct representations of the events, characters, and things in the passage as well as the relationships between them using the concepts that are obtained from comprehending the words, clauses, and sentences in the passage.

English textbook designers should focus that a reading passage must be composed of a wide variety and a high level of linguistic expertise displayed by grammatical resources in language creation. Consequently, syntactic complexity has been proven to have a positive correlation with

formality in a reading passage. When a student reads an English text, they often do it intending to gain knowledge and stay current on a certain topic or event (Howie, 2022). A passage therefore should be more academic that includes intricate and diverse vocabulary. Word information in a reading passage within the English textbook should provide scores of densities in various types of parts of speech, such as nouns, pronouns, adjectives, verbs, adverbs, prepositions, cardinal numbers, determiners, and possessives that must be as more challenging as those in the GAT.

Implications for English Language Teachers

Teachers are the direct beneficiaries of this situation. They must use English textbooks in the classroom and also prepare their students for national tests such as the GAT and O-NET. In terms of the readability level, linguistic characteristics, and subject matter, the results reveal distinctions between the instructional and test or assessment tools. However, some factors are beyond the teachers' ability to manage and control. They must adhere to the curriculum's certified content and utilize the specified English textbooks when instructing. It is suggested that teachers should take into account certain factors when using instructional materials.

First, teachers should research ideas and best suggestions for choosing an English textbook for the class by examining several chosen textbooks to ensure that it motivates the students well and explains clearly. Teachers should focus on areas where the passages in a textbook and the lessons significantly overlap with data in co-reference cohesion identified using a noun, pronoun, or noun phrase based on the text cohesiveness measuring. This can be unexpectedly challenging for certain classes.

In addition, teachers should be aware and pay attention to the types of errors which play an important role in the effectiveness of explicit and implicit correction of reading passages in English textbooks. Furthermore, teachers should introduce these language characteristics to students to use them effectively so that they can prepare the content well-internalized.

Implications for Test Developers

It should be taken into account that the GAT and English textbooks in Thailand must have comparative distinct natures and purposes. The GAT is intended to be applied as an accomplishment test, and its primary objective is to evaluate students' learning achievement. Meanwhile, English textbooks should be constructed to enhance students' reading skills, attract and motivate learners, and also to accommodate individual variances. As a result, test developers should consider creating test items that can be able to assess students' English reading skills after they have completed their Grade 12 program based on the curriculum set by the Ministry of Education.

The substance of the required English textbooks, the requirements of the core curriculum, and the scope of the examinations may all need to be thoroughly reviewed. Test developers should select reading passages that are suitable for all Grade 12 students based on an average point of a national literacy rate accumulated from academic process.

The results of this study can reflect some dimensions of evaluating the entire reading test. It can be presumed that reading passages in the GAT are more challenging compared to those in English textbooks on which language linguistic characteristics were based. Test developers should focus not only on some linguistic features of readability, but also on how to relate the level of reading passages with the Thai core curriculum. Test developers should be aware of the standard core curriculum, concentrate on the level of reading skills of Thai students, and compare it to English textbooks that are used and applied in class.

Limitations of the Study and Recommendations

This study aimed at examining the readability of reading passages in the GAT compared with English textbooks in Thailand for the upper secondary level by using Coh-Metrix which

analyzed linguistic characteristics in the eleven categories including Flesch Reading Ease and Flesch-Kincaid Grade Level. However, other essential factors, such as the readers and the reading tasks or activities, must be taken into account in order to determine the reading passages' level of difficulty. The level of reading skills, the students' motivation, and the goals for which they read all affect the comprehension process. The students' contact with the target reading text also has some bearing on the reading process.

In addition, reading activities should be attended to as an interactive method of how students approach the reading passages along with familiarity with the passages. These factors were beyond the focus and scope of this present investigation. As a result, it is recommended that this process should be done with careful attention because the study made an effort to identify how difficult reading texts was. Further investigation should concentrate on student characteristics and attitudes toward reading passages in both English textbooks and national tests in order to evaluate or generalize the outcomes of the current study.

There are a lot of factors that are connected to the passages, and they need to be given more consideration, especially when choosing texts or passages that are going to be applied in teaching and testing reading skills. It is important for students to be aware of the topic area of a passage because of their potential to alter the ease or difficulty with which the reading passage can be comprehended. A topic might affect how difficult reading a passage is. Moreover, there is still an opportunity for further investigation into the extent concerning students making use of topic area information of reading passages in order to comprehend the reading passages that are included in the assessment.

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Appendix A

Average Score of General Aptitude Test (GAT) from 2010 to 2021

Month/ Year	Average Score (Total: 150)	The Percentage of Average Score (Total: 100)
July 2010	46.92	31.28
October 2010	49.32	32.88
March 2011	54.84	36.56
December 2011	50.45	33.63
March 2012	52.98	35.32
October 2012	49.07	32.71
March 2013	53.63	35.75
March 2014	52.43	34.95
April 2014	59.26	39.51
November 2014	49.91	33.27
March 2015	51.78	34.52
November 2015	40.39	26.93
March 2016	45.14	30.09
November 2016	40.36	26.91
March 2017	45.34	30.23
February 2018	46.35	30.90
February 2019	53.63	35.75
February 2020	55.09	36.73
February 2021	52.43	34.95
Mean Score	49.96	33.31

Appendix B

Coh-Metrix Indices and Coh-Metrix Indices Norms

Index	Label	Full Description	Indices Norms
Category 1: Descriptive			
1	DESPC	Paragraph count, number of paragraphs	-
2	DESSC	Sentence count, number of sentences	lower value = easier
3	DESWC	Word count, number of words	lower value = easier
4	DESPL	Paragraph length, number of sentences, mean	lower value = easier
5	DESPLd	Paragraph length, number of sentences, standard deviation	-
6	DESSL	Sentence length, number of words, mean	lower value = easier
7	DESSLd	Sentence length, number of words, standard deviation	lower value = easier
8	DESWLsy	Word length, number of syllables, mean	lower value = easier
9	DESWLsyd	Word length, number of syllables, standard deviation	lower value = easier
10	DESWLlt	Word length, number of letters, mean	lower value = easier
11	DESWLltd	Word length, number of letters, standard deviation	lower value = easier
Category 2: Text Easability Principal Component Scores			
12	PCNARz	Text Easability PC Narrativity, z score	higher value = easier
13	PCNARp	Text Easability PC Narrativity, percentile	higher value = easier
14	PCSYNz	Text Easability PC Syntactic simplicity, z score	higher value = easier
15	PCSYNp	Text Easability PC Syntactic simplicity, percentile	higher value = easier
16	PCCNCz	Text Easability PC Word concreteness, z score	lower value = easier
17	PCCNCp	Text Easability PC Word concreteness, percentile	lower value = easier
18	PCREFz	Text Easability PC Referential cohesion, z score	higher value = easier
19	PCREFp	Text Easability PC Referential cohesion, percentile	higher value = easier
20	PCDCz	Text Easability PC Deep cohesion, z score	lower value = easier
21	PCDCp	Text Easability PC Deep cohesion, percentile	lower value = easier
Category 2: Text Easability Principal Component Scores			
22	PCVERBz	Text Easability PC Verb cohesion, z score	higher value = easier
23	PCVERBp	Text Easability PC Verb cohesion, percentile	higher value = easier
24	PCCONNz	Text Easability PC Connectivity, z score	higher value = easier
25	PCCONNp	Text Easability PC Connectivity, percentile	higher value = easier
26	PCTEMPz	Text Easability PC Temporality, z score	higher value = easier
27	PCTEMPp	Text Easability PC Temporality, percentile	higher value = easier
Category 3: Referential Cohesion			
28	CRFNO1	Noun overlap, adjacent sentences, binary, mean	lower value = easier
29	CRFAO1	Argument overlap, adjacent sentences, binary, mean	lower value = easier
30	CRFSO1	Stem overlap, adjacent sentences, binary, mean	lower value = easier
31	CRFNOa	Noun overlap, all sentences, binary, mean	lower value = easier
32	CRFAOa	Argument overlap, all sentences, binary, mean	lower value = easier
33	CRFSOa	Stem overlap, all sentences, binary, mean	lower value = easier
34	CRFCWO1	Content word overlap, adjacent sentences, proportional, mean	higher value = easier
35	CRFCWO1d	Content word overlap, adjacent sentences, proportional, standard deviation	higher value = easier
36	CRFCWOa	Content word overlap, all sentences, proportional, mean	higher value = easier
37	CRFCWOad	Content word overlap, all sentences, proportional, standard deviation	higher value = easier

Index	Label	Full Description	Indices Norms
Category 4: Latent Semantic Analysis			
38	LSASS1	LSA overlap, adjacent sentences, mean	lower value = easier
39	LSASS1d	LSA overlap, adjacent sentences, standard deviation	higher value = easier
40	LSASSp	LSA overlap, all sentences in paragraph, mean	lower value = easier
41	LSASSpd	LSA overlap, all sentences in paragraph, standard deviation	higher value = easier
42	LSAPP1	LSA overlap, adjacent paragraphs, mean	-
43	LSAPP1d	LSA overlap, adjacent paragraphs, standard deviation	-
44	LSAGN	LSA given/new, sentences, mean	higher value = easier
45	LSAGNd	LSA given/new, sentences, standard deviation	lower value = easier
Category 5: Lexical Diversity			
46	LDTTRc	Lexical diversity, type-token ratio, content word lemmas	lower value = easier
47	LDTTRa	Lexical diversity, type-token ratio, all words	lower value = easier
48	LDMTLDa	Lexical diversity, MTLD, all words	lower value = easier
49	LDVOCDa	Lexical diversity, VOCD, all words	lower value = easier
Category 6: Connectives			
50	CNCAll	All connectives incidence	lower value = easier
51	CNCCaus	Causal connectives incidence	lower value = easier
52	CNCLogic	Logical connectives incidence	lower value = easier
53	CNCADC	Adversative and contrastive connectives incidence	lower value = easier
54	CNCTemp	Temporal connectives incidence	lower value = easier
55	CNCTempx	Expanded temporal connectives incidence	lower value = easier
56	CNCAdd	Additive connectives incidence	lower value = easier
57	CNCPos	Positive connectives incidence	lower value = easier
58	CNCNeg	Negative connectives incidence	lower value = easier
Category 7: Situation Model			
59	SMCAUSv	Causal verb incidence	higher value = easier
60	SMCAUSvp	Causal verbs and causal particles incidence	higher value = easier
61	SMINTEp	Intentional verbs incidence	higher value = easier
62	SMCAUSr	Ratio of casual particles to causal verbs	lower value = easier
63	SMINTEr	Ratio of intentional particles to intentional verbs	lower value = easier
64	SMCAUSlsa	LSA verb overlap	lower value = easier
65	SMCAUSwn	WordNet verb overlap	higher value = easier
66	SMTEMP	Temporal cohesion, tense and aspect repetition, mean	higher value = easier
Category 8: Syntactic Complexity			
67	SYNLE	Left embeddedness, words before main verb, mean	lower value = easier
68	SYNNP	Number of modifiers per noun phrase, mean	lower value = easier
69	SYNMEDpos	Minimal Edit Distance, part of speech	higher value = easier
70	SYNMEDwrd	Minimal Edit Distance, all words	higher value = easier
71	SYNMEDlem	Minimal Edit Distance, lemmas	higher value = easier
72	SYNSTRUTa	Sentence syntax similarity, adjacent sentences, mean.	higher value = easier
73	SYNSTRUTt	Sentence syntax similarity, all combinations, across paragraphs, mean	higher value = easier
Category 9: Syntactic Pattern Density			
74	DRNP	Noun phrase density, incidence	lower value = easier
75	DRVP	Verb phrase density, incidence	higher value = easier
76	DRAP	Adverbial phrase density, incidence	higher value = easier
77	DRPP	Preposition phrase density, incidence	lower value = easier

Index	Label	Full Description	Indices Norms
78	DRPVAL	Agentless passive voice density, incidence	lower value = easier
79	DRNEG	Negation density, incidence	higher value = easier
80	DRGERUND	Gerund density, incidence	lower value = easier
81	DRINF	Infinitive density, incidence	higher value = easier
Category 10: Word Information			
82	WRDNOUN	Noun incidence	lower value = easier
83	WRDVERB	Verb incidence	higher value = easier
84	WRDADJ	Adjective incidence	lower value = easier
85	WRDADV	Adverb incidence	higher value = easier
86	WRDPRO	Pronoun incidence	higher value = easier
87	WRDPRP1s	First person singular pronoun incidence	higher value = easier
88	WRDPRP1p	First person plural pronoun incidence	higher value = easier
89	WRDPRP2	Second person pronoun incidence	higher value = easier
90	WRDPRP3s	Third person singular pronoun incidence	higher value = easier
91	WRDPRP3p	Third person plural pronoun incidence	lower value = easier
92	WRDFRQc	CELEX word frequency for content words, mean	higher value = easier
93	WRDFRQa	CELEX Log frequency for all words, mean	higher value = easier
94	WRDFRQmc	CELEX Log minimum frequency for content words, mean	higher value = easier
95	WRDAOAc	Age of acquisition for content words, mean	lower value = easier
96	WRDFAMc	Familiarity for content words, mean	higher value = easier
97	WRDCNCc	Concreteness for content words, mean	higher value = easier
98	WRDIMGc	Imagability for content words, mean	higher value = easier
99	WRDMEAc	Meaningfulness, Colorado norms, content words, mean	higher value = easier
100	WRDPOLc	Polysemy for content words, mean	higher value = easier
101	WRDHYPn	Hypernymy for nouns, mean	lower value = easier
102	WRDHYPv	Hypernymy for verbs, mean	higher value = easier
103	WRDHYPnv	Hypernymy for nouns and verbs, mean	lower value = easier
Category 11: Readability			
104	RDFRE	Flesch Reading Ease	higher value = easier
105	RDFKGL	Flesch-Kincaid Grade Level	lower value = easier
106	RDL2	Coh-Metrix L2 Readability	higher value = easier