

A Review of Text Readability in China

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Abstract

This study is to fill the blanks of comprehensive review of text readability in China so as to offer references both to scholars who are dedicated themselves to these areas and to learners and practitioners who are still struggling with readability. In order to do that, affecting factors, measurements, and previous studies and further trends constitute this research. We found that the measurements of readability largely limit to lexis and syntax factors. Besides, studies of readability have been stagnant on its measurement and influencing factors. Thus, on the one hand, we encourage scholars to further update readability formula which takes reader factors, setting and genres into consideration. On the other hand, studies on the relationship between readability and lexical richness, online learning environment, teachers' and peers' support deserve our attention.

Keywords

Text readability; Measurement; Affecting factors.

1. Introduction

Text readability, refers to the difficulty level, the genre and style of text as well readers' understanding of the text. The earliest research on text readability in the world can be traced back to 1920s. The past century has witnessed both theoretical accomplishments and practical outcomes. It is one of the criteria to be considered while designing reading materials for readers of all levels. To be specific, its research areas range from analysis of news, contracts, insurance issues to military manuals. However, the studies on text readability have depict a different picture. Besides, it is of significance to present a full picture of text readability in the whole word. However, the development of text readability has not so far been sorted out. Therefore, this research is to present a comprehensive picture of text readability.

2. Previous studies on Text Readability

2.1. Factors Affecting Text Readability

Studies on text readability can be accomplished after its influencing factors are determined. It has extensively attracted scholars' attention, such as Betts (1949), Rosenshine (1968), Deehant & Smith (1961/1977), Bruee & Rubin (1988) and Green (1988). For Betts (1949), lexis is the definitive factor, which includes the average number of words per sentence, number of simple sentences, number of prepositional phrases, percentage of different words, number of uncommon words, number of words beginning with certain letters, the number of polysyllabic words, adjectives and adverbs, personal pronouns and the number of other personal referential words. Betts' classification is apparently incomplete which only covers vocabulary. In addition, Rosenshine (1968) also propped that text readability rise along with the use of words including "rather, quite a bit, might, possibly". Besides, irrelevancy also adds to lower readability. From the other side, using explanatory conjunctions, such as "because" and "in order to" contribute to higher readability. Furthermore, the employment of rules-examples-rules method also made text easier to understand. It is understandable that the organization of text has an influence on

readability since after all reading is a sophisticated process involving multiple efforts. Later on, Deehant & Smith (1961/1977) believed other than vocabulary factors, such as word length and the number of syllables, sentence types, number of illustrations, writing purpose, the organization of materials and the relationship between typography and content all matters when it comes to text readability. From their classification, we can detect without effort that it expands to sentence level and some external factors concerning the writers. In 1988, what Bruee & Rubin (1988) and Green (1988) come up with is a breakthrough. They have shifted the focus to non-linguistic factors, including reader factors and reading circumstance. As Bruee & Rubin (1988) pointed out that readers' interest, motivation, beliefs, background information as well as reading environment is crucial to text readability but has been neglected for a long period. Green (1988) also found that readers' interests play a vital role in determining infants' text readability. Other than aforementioned, the organization of reading materials, the frequency of terms and words also matters.

As we can summarize from previous studies on readability on influencing factors, it can be categorized into external factors and internal factors or textual factors. External factors involve both the readers and circumstances. More specifically, reader factors include individual differences in personal interests, motivation, universal knowledge and so forth, which vary from individuals to individuals. Due to its uncertainty, it remains to be a conundrum even in today. Internal factors, on the other hand, constitute primarily lexis and syntax. It seems that we have covered all possible factor that affecting text readability. However, with burgeoning online learning, learning environment such as the stableness of internet connection, the distraction of advertisements and short video clips should be reconsidered.

2.2. Measurements of Text Readability

How to measure readability has been the center of text readability studies. The traditional way is done through Question-and-Answer Technique and Sentence Completion Technique. However, due to large arbitrariness, subjectivity and lower accurateness, it was under attacks by quite a few scholars. To overcome these difficulties, formulas are put forward and this way of measuring readability has been widely accepted. Readability formulas have quantified the relationship between textual factors and readability. Some of the formulas and their calculations are listed as follows.

Flesch Reading Ease (Flesch) = $206.835 - (84.6 * SYLLS / 100W) - (1.015 * WDS / SEN)$ (Rudolf Flesch, 1948)

Fry = Referring to the table (Edward Fry, 1965)

Simple Measure of Gobbledygook (SMOG) = $\sqrt{P} + 3$ (Harry McLaughlin, 1969)

As we observe, these formulas are based on vocabulary and sentences. Concerning words, word frequency is used in the formulas. As we aware, words that rarely occur take more time to process. With regard to sentence complexity, sentence length is widely accepted and used in the formulas due to its high validity and accurateness. Generally speaking, long sentences inclined to have more modifiers with embedding phrases, clauses and participles. Despite their similarities, their discrepancies lie in three aspects. To start with, formulas vary with programmers' different understandings on factors affecting text readability. For example, some believe these factors are limited to textual facts such as the average number of syllables, the ratio of familiar words and average length of sentences. Besides, the proportion of each factor is different even if the designers have shared understanding of factors influencing readability. For instance, one may allocate 50 percent to sentence length and the other distribute only 30 percent. In addition, due to various sample material chosen when designing the formula, its accurateness, effectiveness and application is different.

Formulas are currently the most economical and practical tools with objectiveness. Its validity has been proven. In Klare's study conducted in 1976, more than half, 19 out of 36, of the

experiments, the adjusted versions were viewed easier to understand. Likewise, Entin & Klare compared 12 original materials to 12 adjusted materials with higher difficulty through cloze test. The study has found that learners grades in significantly higher in original materials than that of adjusted materials. Nevertheless, some scholars who did not spot significance argue that text readability as well as vocabulary and sentence complexity do not have clause and effect relationship. To face these accusations, Harrison (1980) attributed to following three reasons. (1) Low quality of revisions. (2) Insensitiveness of the text to revisions. (3) Reading time pressure. In a word, these formulas are accepted to some extent.

But they are not flawless. To start with, they still all fail to take reader factors and external environment into consideration which are pivotal influencing factors of text readability. As we know, individual factors such as motivation tends to affect learners' understanding towards the text. For instance, students who are forced to read or have low interests, they are apt to gain less understandings. Fortunately, it is a two-way direction. For learners with strong motivation, they have a tendency to read the texts with higher complexity. However, to measure readers' interests and motivation is not an easy task to accomplish due to its subjectivity. Difficult as it be, endeavors should be made to measure readers' interests, motivations and so forth. To be a matter of fact, these positive personal traits should be seen from a new perspective since the trend of positive psychology was introduced into the field of second language acquisition by MacIntyre & Gregersen (2012) and Lake (2013) in the past decade. Besides, using sentence length to predict sentence complexity can sometimes be tricky. In other words, a long sentence is not necessarily a complicated sentence. For example, if a long sentence consists of several short and simple sentence combined by conjunctions like "and, but and so", we can't say for certain that a sentence with a clause is simpler. Furthermore, being complicated does not entail difficult. As far as we are concerned, simple and complex is a pair of concepts in in terms of grammar structure. While easy and difficult is stated from psychological perspective.

2.3. Text Readability in China

Text readability abroad starts from 1920s. The past century has witness fruitful discovery of influencing factors, measurements of text readability and the relationship between citation. These first two aspects have actually been covered in previous sections. To be specific, the history of how studies are conducted to find out those factors has been sorted out previously in section "Factors Affecting Text Readability". And measurements of text readability abroad have also been covered in section "Measurements of Text Readability". Besides, scholars abroad have recently shed lights on the relationship between text readability and citation rate as well as writing quality. For instance, Stremmersch et al. (2007) uncovered that text readability and citation rate are in inverse proportion. On this very note, compositions with higher index are more comprehensible, hence higher citation rate. However, the opponents, such as Metoyer-Duran (1993) stands for the opposite side, favoring direct proportion between citation index and text readability. What is more, it has been proven that text readability varies in different disciplines. Hartley & Benjamin (1998) made a contrast and comparison between structured and unstructured abstracts from psychological journals and discovered that text readability index of structured abstracts is higher than its counterparts, hence more comprehensible. Besides, Wu's research (2017) on syntactic complexity on text readability validify the idea that discipline differences exist in text readability. Syntactic complexity indeed varies in different subjects and has deep influence on text readability as well.

The history of domestic studies on text readability can be dated back to the end of 21st century. Comparing to studies abroad, domestic studies is falling behind. Previous domestic studies can be categorized into three aspects. (1) Introduction and assessment. Earlier studies on readability at home begin with introduction and assessment. Lin Zheng (1995) reviewed factors affecting readability in his two essays "Measurement of English Readability" as well as

“English Readability, Difficulty and Testability”. In addition, Li Zhaoshan (2000) depicts a full picture of text readability from four aspects including factors affecting text readability, formulas, validity of readability as well as drawbacks of readability. Moreover, Yan Shenghong & Huang Li (2005) not only reviewed development of readability but evaluate four measuring software. More importantly, they classified studies on readability into three categories. The first group focused on text and reading setting and effects they have on text readability. The second group sees readability from the perspective of reading test and psychology. And the typical way to do it is through “Question and Answer Technique”. The last group quantified linguistic features of text, studies on readability formulas, so to speak. The third type is the mainstream of text readability studies. (2) Theoretical studies. While introducing text readability, its theoretical studies have also been explored by Chinese scholars, such as Lin zheng(1995), Li Zhaoshan(2000), Yan Shenghong & HuangLi(2005) as well as Xing Fukun, Chengg Dongyuan & Pu Jianzhong(2008). Their studies range from the predictability of readability and its measurement to its validity and significance. For example, Lin (1995) found that controlling factors affecting readability offsets their certain effects on readability. By controlling, he figured out that measuring words and sentences are the key to calculate text readability. In regard to significance of readability, Xing et al. (2008) believe that readability supports autonomous learning and even modern foreign language learning at large. It also helpful to push teaching through appropriately chosen reading materials. In today, it even useful when optimizing online learning resources. (3) Measurement of readability. Text readability have been targeted primarily under Chinese background. Applications are developed including ERDA, ERMS and IRMS. ERDA (English Readability & Difficulty Assessment) is a software developed by Fujian Normal University to measure English readability. Its developer believes that readability is determined by lexis and syntax. Though it was criticized due to its unscientific words acquisition. It is Chinese scholars’ first attempt to measure readability, which usher us into a period with various formulas. Later on, ERMS (English Readability Measurement System) was proposed by research groups in Chongqing University. In this software, four levels of words are divided, including level 1 (precollege vocabulary), level 2(CET-4 vocabulary), level 3 (CET-6 vocabulary) and level 4 (TEM 8 vocabulary and GRE vocabulary). It is capable of counting tokens, types, sentences, syllables. Based on this figures, lexical density, and FRE can be calculated. Besides, words were put into 4 categories automatically. These functions enable ERMS to become the most influential software to calculate readability. Besides, corpus technology also contributes to openness and rapid update. Moreover, lexical density was added to ensure validity of lexical density. Nevertheless, its shortcomings such as word file recognition only limits its application. In addition, IRMS (Information-based Readability Measuring System) was designed by Xing et al. (2008). This system applies four corpora, BROWN, LOB, FROWN and FLOB. IRMS successfully overcame the problem of ignoring lexical order, reader factors and setting by taking these factors into consideration. This have largely increased its validity and expands its applications as well. More significantly, Xing’s model has surpassed other traditional ones, which is of great theoretical and practical meanings. (4) Applications. Domestic studies have primarily been employed for textbook and reading materials assessment. Gu & Guan randomly calculated CET4(College English Test Band 4), CET6 (College English Test Band 6) as well as reading materials for college students employing Flesch formula. The results demonstrated that CET materials have greatly matched the Flesch formula. Compared to studies abroad, studies at home rarely tapped into academic text analysis. Several scholars, Wu (2017) in this case published an article titled A study on Syntactic Complexity and Text Readability of International Journal Articles by Chinese Scholars. This paper suggests significant discipline difference in syntactic complexities and offers succinct guidance for further research on lexical sophistication and text readability.

To summarize, China's readability research starts from introduction of studies abroad. After the introduction to it, its theoretical studies are catching up. Later on, the measurement (RDA, ERMS and IRMS) come into place. IRMS remains to be the most effective tool to measure readability. The reason that IRMS outweigh other software is its consideration of reader factors and settings. Besides, Chinese scholars have applied text readability into textbook designing and other reading materials assessment.

3. Conclusion

So far, affecting factors of readability, measurement tools of readability, previous studies of readability have been presented. There are two implications to be drawn.

(1) Improvements of readability formulas should be made. As we aware, traditional formulas have their own application areas. For example, formulas designed to calculate English textbooks may not be suitable for academic articles. Nevertheless, it is not to encourage more formulas should be devised. Rather, we should take disciplines and genres into consideration when calculating readability.

(2) Studies on readability should be more diverse. From previous sections, we can observe that studies on text readability have been either fixed on its measurement or its affecting factors. Actually, it can open to amounts of areas, such as the relationship with lexical richness and other related items. Moreover, how readability varies in online learning environment and traditional classrooms and how peers' and teachers' support affect learners' readability are both intriguing questions worth investigating.

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