Original Research

AN ANALYSIS OF WORD-SENTENCE LENGTHS AND READABILITY LEVELS OF TEXTS IN PRIMARY SCHOOL TURKISH TEXTBOOKS

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ABSTRACT

A large portion of educational activities in Turkey is conducted through textbooks. This is also true for teaching Turkish. Therefore, students' competency in reading and understanding their native language depends on the appropriateness of textbook texts to students' developmental, age, and knowledge levels. One of the important criteria in evaluating textbook texts is readability. This research aimed to examine the word and sentence lengths along with readability levels of texts in primary school (1st, 2nd, 3rd, and 4th grade) Turkish textbooks. The study was conducted using a descriptive survey design. The study materials consist of texts from primary school Turkish textbooks published by the Ministry of National Education (MEB) Publications, which began to be used in the Fall Semester of the 2024-2025 Academic Year. Poems and listening texts were excluded from the research scope. In data analysis, readability formulas developed by Ateşman (1997), Çetinkaya-Uzun (2010), and Bezirci-Yılmaz (2010) were used. Research results revealed that word lengths in textbook texts did not show a regular increase according to grade level, but sentence lengths increased with grade level. The Kruskal-Wallis H test found statistically significant differences in word and sentence lengths across grade levels. When examining the readability levels of primary school Turkish textbook texts, they were generally found to be medium according to Ateşman Readability Level and at educational level according to Çetinkaya-Uzun Readability Level. According to Bezirci-Yılmaz Readability Level, texts in first and second-grade Turkish textbooks were at primary school level, while texts in third and fourth grades were at high school level. This situation revealed that readability scores and levels of texts at the same grade level vary according to different formulas.

Keywords: Primary school, Turkish textbooks, readability, word-sentence lengths

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1. INTRODUCTION

Reading is a skill that has maintained its importance in human life since the day oral language was expressed through written symbols. One of the main reasons for this is that reading is effective in all areas, from the simplest daily activities such as shopping, watching television, using phones or computers, to the most complex scientific, social, and economic activities (Özçelik, 2011). Another reason is that despite developments in science and technology until today, humanity's basic learning method has remained unchanged. Reading, as in the past, continues to be the easiest, most economical, and dominant way to access rich and extensive information sources, forming a prerequisite for learning (Akyol, 2011; Strickland, Boon & Spencer, 2013). Indeed, many studies in reading science have shown that reading skill is an effective factor in shaping human academic, social, and economic life (Hulme & Snowling, 2011; Keskin & Baştuğ, 2013; Martinez & Fernandez, 2010). Studies indicate that reading is related to crime rates, school dropout rates, and maintaining a healthy life (Daniel et al., 2006; Hernandez, 2011). Reading's influence over various aspects of human life has made it an indispensable part of human existence.

There are many different views in the literature regarding the definition of reading skill. This is because reading has a multidimensional structure. Looking at the definitions put forward, it can be seen that reading was previously defined more through skills representing the mechanical aspects of language such as letter-sound relationships, word recognition, and automaticity (LaBerge & Samuels, 1974; Logan, 1988). Current definitions describe reading through skills such as integrating background knowledge into text, catching textual clues, and making inferences, focusing more on the meaning dimension of language (Armbruster et al., 2001; NRP, 2000). Synthesizing definitions from past to present, reading represents a complex process where the reader constructs meaning through interaction and participation with written symbols (Pikulski & Chard, 2005). Therefore, reading goes beyond merely vocalizing encountered words. Its sole purpose is to achieve comprehension. For successful reading, it is necessary to identify and address factors affecting an individual's reading comprehension. Research in literature indicates that difficulties in reaching comprehension can stem from many variables such as vocabulary, background knowledge, methods and strategies used, reading motivation, early literacy, and fluent reading (Gersten, Fuchs, Williams & Baker, 2001), as well as from the quality of written materials used in the reading process.

Educators utilize various teaching materials to make their lessons effective. Teaching material refers to all written or drawn, mechanical or electronic tools and equipment that enable information transfer between student and source (Bora & Arslan, 2021). In Turkey, a large portion of educational activities is conducted through textbooks, which are one of the teaching materials (Yalçın, 1996; Şahin, 2015). This is also true for teaching Turkish. Turkish textbooks are the primary source for acquiring language skills (Ülper, 2018). Indeed, Özbay's (2003) study on textbooks supports this situation by revealing that Turkish teachers mostly (94%) conduct their lessons adhering to textbooks. Therefore, students' competency in reading and understanding their native language depends on the appropriateness of textbook texts to students' developmental, age, and knowledge levels (Yılar, 2016). For this reason, one of the most important stages in preparing textbooks is the selection of texts to be included. One of the important criteria in evaluating the quality of selected texts is the concept of readability.

Readability briefly refers to how easily or difficultly a text can be understood by the reader (Ateşman, 1997). Before discussing the concept of readability in detail in this section, it would be beneficial to address the concepts of "legibility" and "comprehensibility" which are frequently used interchangeably in literature. Such an attempt will serve to understand the concept of readability more clearly and

eliminate conceptual confusion. Legibility is a concept that refers to the visual presentation of the text. In other words, it refers to external structural features such as text font size and page layout (Anagnostou & Weir, 2006). Comprehensibility, on the other hand, is a concept related to the content of the text. It refers to qualitative features of the text such as the subject matter and how information within the text is conveyed through strategy and sequence (Ateşman, 1977). While comprehensibility is related to the semantic component of language, readability is a concept more related to the syntactic component of language, such as word and sentence length.

Readability is a criterion related to the quantitative characteristics of the text. The main purpose of this criterion is to determine the appropriateness of the text for the target audience based on word and sentence lengths (MEB, 2021). Studies on readability encourage the use of comprehensible language in texts (Chall, 1983). High readability of texts in textbooks is an indicator that their comprehensibility will also be high. Studies have shown that texts consisting of short, simple, and regular sentences have higher readability compared to texts consisting of long words or long sentences (Benjamin, 2012; Yalın, 1996). If texts are too difficult in terms of readability, they cannot be read fluently by the reader; if they are too easy, this can lead to decreased reading motivation (Güneş, 2000). Therefore, the readability levels of texts in textbooks, which are the primary material in acquiring reading skills, are of great importance.

There are many different methods for determining the readability levels of texts. Question-answer technique, expert opinion, sentence completion, and readability formulas are the main ones. Among these methods, readability formulas are frequently preferred as they are more objective and functional. In calculating readability formulas, variables such as syllable count, word length, and sentence length are primarily used as bases (Zorbaz, 2007). In our country, the first studies in the field of readability began with Ateşman's adaptation of Flesch's readability formula to Turkish in 1997 (Bağcı & Ünal, 2013). This was followed by the Çetinkaya-Uzun Readability Formula (2010) and Bezirci-Yılmaz Readability Formulas (2010). While Ateşman's readability formula was an adaptation study, the other two formulas were developed specifically for Turkish language structure. Although data obtained from these formulas provide insight about the difficulty of texts and their suitability for the target audience, they do not provide definitive information about the comprehensibility or quality of the texts. Therefore, interpreting the results from formulas along with the qualitative features of the text will lead to more realistic conclusions (Zorbaz, 2007).

Reading plays a key role in making an individual a lifelong learner who develops themselves and adapts to their society. When considered this way, reading is one of the critical skills that can be acquired during school years. Although most students don't experience problems in learning to read, a considerable number of students face difficulties in this process (Lyon, Shaywitz & Shaywitz, 2007). At this point, it is crucial to examine the texts in Turkish textbooks, which are the primary source of reading instruction, in terms of readability levels. Studies have indicated that text readability levels are an effective factor in the journey of reaching comprehension, which is the ultimate goal of reading skill (Durukan, 2014; Ulusoy, 2009). Additionally, the fact that primary school years are a critical period for reading and comprehension skills shows the importance of examining the readability levels of texts in Turkish textbooks for grades 1, 2, 3, and 4. Furthermore, when examining readability studies in local literature, it has been observed that very few studies have compared primary school level texts according to the results of readability formulas (Zorbaz, 2007; Özbek & Ergül, 2018; Bağcı Dağdeviren & Küçüktepe, 2022; Yokuş & Yaşar, 2023). Therefore, it is thought that the current research results will contribute to the expansion of relevant literature. In this context, the aim of the research is to examine the word and sentence lengths along with readability levels of texts in primary

school Turkish textbooks. In this direction, the following questions were sought to be answered in the study:

• What are the word-sentence lengths in primary school (1st, 2nd, 3rd, and 4th grade) Turkish textbook texts?
• Do word-sentence lengths in primary school (1st, 2nd, 3rd, and 4th grade) Turkish textbook texts differ according to grade levels?
• What are the readability scores and levels of texts in primary school (1st, 2nd, 3rd, and 4th grade) Turkish textbooks?
• Do the readability levels of texts in primary school (1st, 2nd, 3rd, and 4th grade) Turkish textbooks differ according to formulas?"

2. METHOD

2.1 Research Design

In this study, a descriptive survey research design was used, which aims to present the current situation as it is. Descriptive survey studies are a preferred method for understanding and explaining the current state of a specific phenomenon (Karasar, 2022). The researcher makes a general evaluation based on the findings. The purpose of the method is to describe the current characteristics in detail rather than questioning the reasons for a situation (Cohen, Manion & Morrison, 2018).

2.2 Study Materials

The study materials of this research consist of texts from primary school Turkish textbooks published by the Ministry of National Education Publications, which began to be used in the fall semester of the 2024-2025 academic year. In the study, the total number of texts in the textbooks was specified. However, poems and listening texts were not included in the analysis due to their different structure and purposes. The fact that such texts generally have a shorter and more aesthetic structure has made them incomparable with other texts in terms of word-sentence lengths and readability levels. Table 1 presents detailed information about the texts within the scope of the research.

Table 1

Information about Books and Texts Included in the Analysis

Grade Level	Publisher	Number of Texts
1st Grade	MEB Publications	10
2nd Grade	MEB Publications	19
3rd Grade	MEB Publications	24
4th Grade	MEB Publications	27
Total		80

2.3 Data Collection and Analysis

In this study, the data sources are primary school textbooks obtained from the official website of the Ministry of National Education, Board of Education and Discipline. Data were collected through text

analysis method. Text analysis is a method based on systematic examination of written content and is frequently preferred in descriptive survey designs (Krippendorff, 2018).

During the data collection process, texts in primary school textbooks were evaluated in accordance with statistical analyses. First, the total number of words, sentences, and syllables for each text was determined. Then, the average number of syllables per word and the average number of words per sentence were calculated. This process enabled the determination of word-sentence lengths and readability levels of the texts.

In analyzing the data, readability formulas developed by Ateşman (1997), Çetinkaya-Uzun (2010), and Bezirci-Yılmaz (2010) were used. These formulas are calculations that consider variables such as words, sentences, and syllables to determine the readability of texts. Different formulas were used in all three studies, and readability levels obtained with each formula were categorized using different classification methods.

Ateşman (1997) Readability Formula

The readability formula developed by Ateşman (1997) is based on sentence length and word count when determining the readability of texts. This formula aims to measure text complexity by analyzing word and sentence lengths in texts. The calculations used provide a measurement based on the basic grammatical features of the text. This formula examines the linguistic structure of texts to reveal which texts are easier or more difficult to understand. Figure 1 shows the formula variables, constants, readability scores, and the corresponding readability level for the relevant score range.

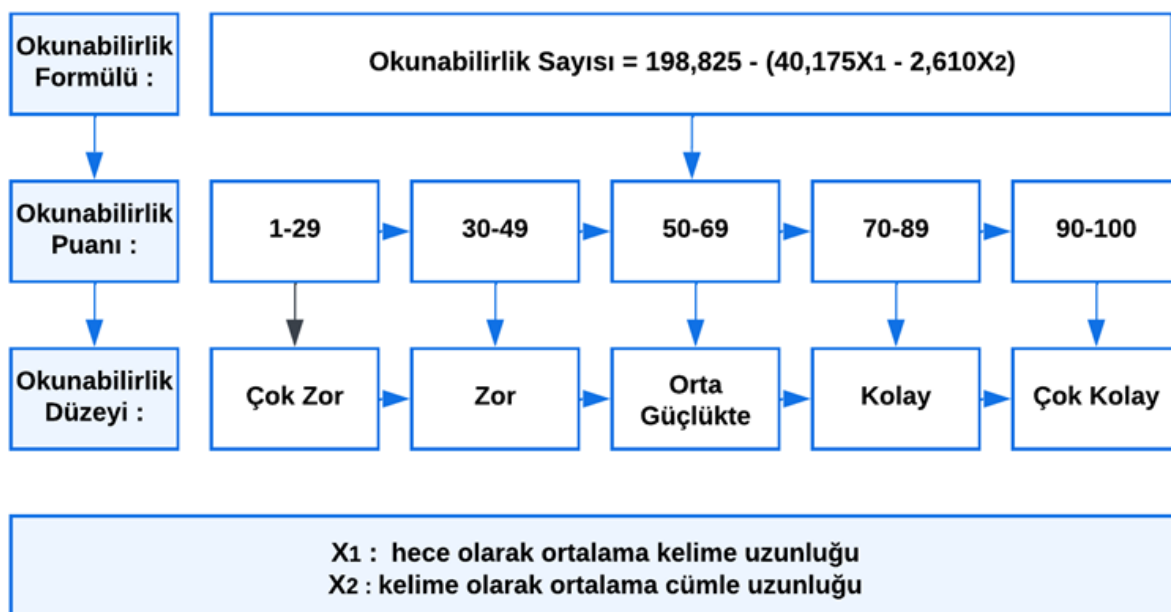*Figure 1.* Ateşman (1997) Readability Formula

Çetinkaya-Uzun (2010) Readability Formula

The Çetinkaya-Uzun (2010) readability formula measures the comprehensibility level of texts through calculations based on word, sentence, and syllable counts. This formula was specifically developed for texts in the Turkish language and provides a structure unique to the language's characteristics. It is an

important tool in evaluating the complexity of texts and the language's impact on the reader. Additionally, it is useful in determining the suitability of texts for the target audience. Figure 1 shows the formula variables, constants, readability scores, corresponding readability level for the relevant score range, and education level.

Okunabilirlik Formülü :	Okunabilirlik Puanı = 118,823 - (25,987 x OKU) - (0,971 x OCU)		
Okunabilirlik Puanı :	0-34	35-50	51+
Okunabilirlik Düzeyi :	Engelli Düzey	Eğitsel Okuma	Bağımsız Okuma
Eğitim Düzeyi :	10., 11. ve 12.Sınıf	8. ve 9.Sınıf	5., 6. ve 7.Sınıf

OKU : Hece olarak ortalama kelime uzunluğu
OCU : Kelime olarak ortalama cümle uzunluğu

Figure 2. Çetinkaya-Uzun (2010) Readability Formula

Bezirci-Yılmaz (2010) New Readability Level

The new readability level proposed by Bezirci-Yılmaz (2010) provides a more comprehensive measurement by considering the grammatical elements of texts. This formula evaluates readability by taking into account both the grammatical structures in texts and the general structural characteristics of the text. The calculations provide a broader perspective aimed at increasing the comprehensibility of the text. Figure 1 shows the formula variables, constants, readability scores, and the corresponding grade level for the relevant score range.

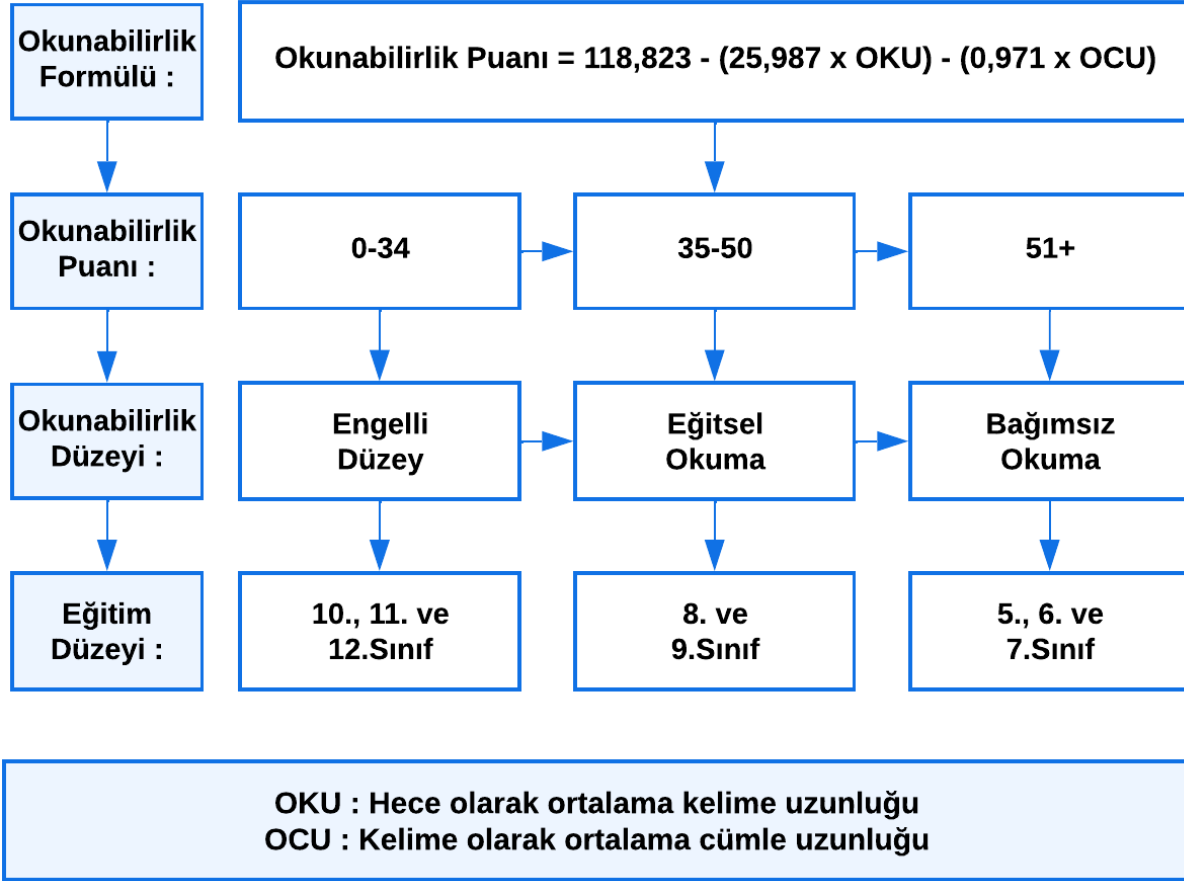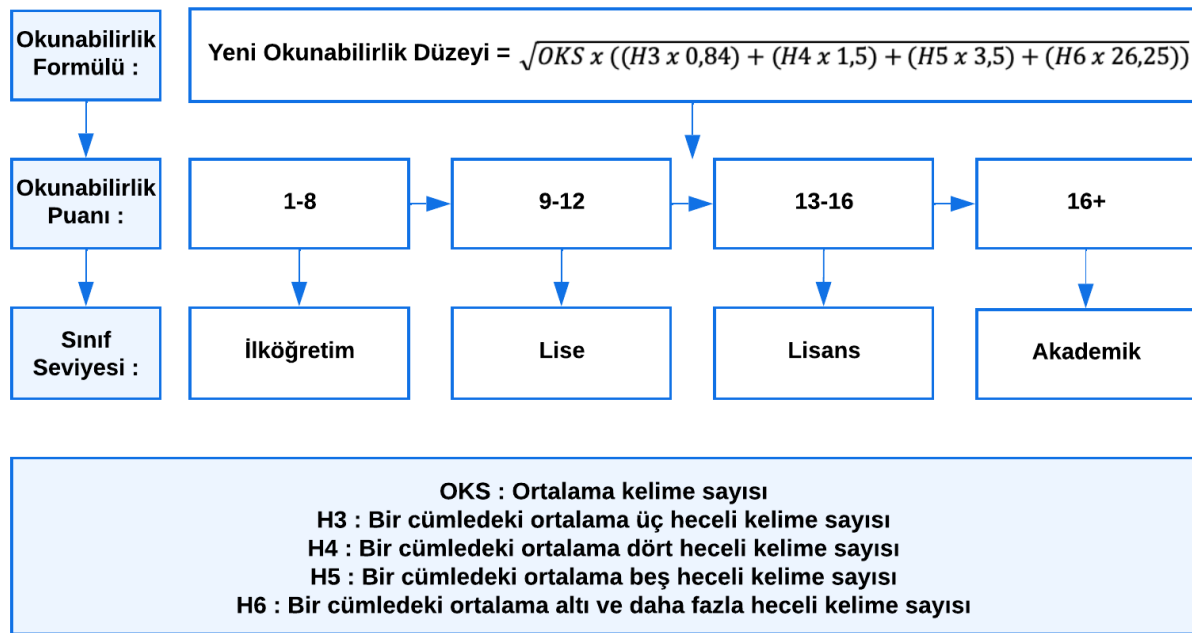$$\text{Yeni Okunabilirlik Düzeyi} = \sqrt{OKS \; x \; ((H3 \; x \; 0{,}84) + (H4 \; x \; 1{,}5) + (H5 \; x \; 3{,}5) + (H6 \; x \; 26{,}25))}$$

Okunabilirlik Formülü :

Okunabilirlik Puanı : | 1-8 | 9-12 | 13-16 | 16+

Sınıf Seviyesi : | İlköğretim | Lise | Lisans | Akademik

OKS : Ortalama kelime sayısı
H3 : Bir cümledeki ortalama üç heceli kelime sayısı
H4 : Bir cümledeki ortalama dört heceli kelime sayısı
H5 : Bir cümledeki ortalama beş heceli kelime sayısı
H6 : Bir cümledeki ortalama altı ve daha fazla heceli kelime sayısı

Figure 3. Bezirci-Yılmaz (2010) New Readability Level

The readability scores and levels of texts within the scope of the research were calculated using Ateşman, Çetinkaya-Uzun, and Bezirci-Yılmaz formulas. Comparisons were made based on these calculations. The Kruskal-Wallis H test was used to determine whether word-sentence lengths of texts differed according to grade levels. The Mann Whitney U test was applied to determine which group caused the significant difference. These methods were preferred to ensure statistical accuracy and to enable a more comprehensive evaluation of the comprehensibility levels of the texts.

3. FINDINGS

3.1. What are the word-sentence lengths in primary school (1st, 2nd, 3rd, and 4th grade) Turkish textbook texts?

In this section, findings regarding the average word-sentence lengths of texts in Turkish textbooks are presented.

Table 2

Average Word-Sentence Lengths of 1st Grade Texts

1st Grade Texts	Average Word Length	Average Sentence Length
Dream Wanderer	2.4375	8.470588235
Şirin's Bird Paintings Exhibition	2.405172414	7.25
Fascinating Magnifying Glass	2.975308642	7.714285714
Going to Teknofest	2.732142857	9.333333333
Sky School	2.74611399	8.041666667
My Father's Toy Chest	2.957446809	7.421052632

Bayram Celebration	2.80104712	5.617647059
Our Rights	2.97752809	6.846153846
The Sun Always Shines for the Hardworking	2.47826087	11.5
Picnic Area	2.715231788	4.081081081
Average	2.722575258	7.627580857

According to the findings in Table 2, while the average word lengths in texts in the 1st grade Turkish textbook vary between 2.40 and 2.97, the average sentence length varies between 4.08 and 11.5. Considering that the average word length in Turkish is 2.60 (Ateşman, 1997; Bezirci and Yılmaz 2010), it is observed that the texts 'Fascinating Magnifying Glass', 'Going to Teknofest', 'Sky School', 'My Father's Toy Chest', 'Bayram Celebration Rights', and 'Picnic Area' have above-average word counts. Considering that the average sentence length in Turkish is 9-10 words (Ateşman, 1997), the text 'Going to Teknofest' has above-average sentence length.

Table 3

Average Word-Sentence Lengths of 2nd Grade Texts

2nd Grade Texts	Average Word Length	Average Sentence Length
Proud Rose	2.218934911	6.76
Model Child	2.630044843	7.079365079
I Love My Elders	2.349514563	6.4375
Ata's Life	2.41322314	4.93877551
How Do I Win?	2.728070175	8.769230769
Kite Season	2.414201183	6.62745098
Chubby	2.605839416	11.41666667
Space Explorer Gökay	2.497382199	7.958333333
Cheerful Explains Nature	2.588888889	7.826086957
Comet and the North Star	2.62406015	7.189189189
And Basketball!	2.5	10.8
Why Should We Have Breakfast?	2.503875969	12.9
White Mustaches	2.305263158	8.260869565
Alexander Graham Bell	2.649651972	11.97222222
Stubborn Shadows	2.65625	7.757575758
Letter	2.256077796	5.508928571
Trojan Horse	2.519444444	8.181818182
Library	2.696261682	6.484848485
Who Understands the Language of Cakes?	2.396984925	6.317460317

Average	2.502840496	8.062437978

According to the findings in Table 3, the average word lengths in texts in the 2nd grade Turkish textbook vary between 2.21 and 2.72. The average sentence lengths vary between 4.93 and 12.90. Considering that the average word length in Turkish is 2.60 (Ateşman, 1997; Bezirci and Yılmaz, 2010), it is observed that the texts 'Model Child', 'Space Explorer Gökay', and 'Alexander Graham Bell' have above-average word lengths. Furthermore, considering that the average sentence length in Turkish is 9-10 words (Ateşman, 1997), it is observed that the texts 'Why Should We Have Breakfast?' and 'Alexander Graham Bell' have above-average sentence lengths.

Table 4

Average Word-Sentence Lengths of 3rd Grade Texts

3rd Grade Texts	Average Word Length	Average Sentence Length
What is a Dream?	3.005208333	8.727272727
World's Highest Book Mountain	2.595744681	11.19047619
Little Nezahat	2.642512077	8.625
Atatürk's Children	2.787755102	8.448275862
National Anthem	2.616613419	12.52
March 18 Martyrs' Memorial Day	2.886597938	12.125
Who Will Save This Bear?	2.336244541	10.40909091
Field Mouse and City Mouse	2.527980535	11.10810811
Atatürk and Compassion	2.516447368	11.69230769
One-Winged Owl Tayga	2.432432432	8.633333333
Stones in the Box	2.305630027	7.612244898
Big Smile	2.836065574	8.133333333
Garden of Hearts	2.389655172	9.0625
Sunflower and Daisy	2.668693009	9.4
Future Professions	2.971428571	11.66666667
Webbed Learning to Swim	2.594594595	5.510638298
Self-Confidence and Mimar Sinan	2.679775281	7.739130435
Turkey's Most Beautiful Houses	2.623417722	13.73913043
Meerkat Grandmothers Give Concert	2.658823529	9.659090909
Color of the Sky	2.793650794	7.636363636
Love is a Bird Magazine	2.546357616	5.807692308
Traveling Water Drop	2.630681818	6.518518519
Swallows in Feşmekan Town	2.918566775	7.487804878
Shapes in the Sky	2.915555556	9.782608696

Average	2.661684686	9.30144116

According to the findings in Table 4, the average word lengths in texts in the 3rd grade Turkish textbook vary between 2.30 and 3.01. The average sentence lengths vary between 5.51 and 13.74. Considering that the average word length in Turkish is 2.60 (Ateşman, 1997; Bezirci and Yılmaz, 2010), it is observed that the texts 'What is a Dream?', 'National Anthem', and 'Future Professions' have above-average word lengths. Furthermore, considering that the average sentence length in Turkish is around 9 words (Ateşman, 1997), it can be said that the texts 'World's Highest Book Mountain', 'National Anthem', and 'Turkey's Most Beautiful Houses' have above-average sentence lengths.

Table 5

Average Word-Sentence Lengths of 4th Grade Texts

4th Grade Texts	Average Word Length	Average Sentence Length
Library in Our Home	2.78974359	8.863636364
What Are Books For?	2.513368984	6.925925926
Book Without a Story	2.563850688	8.627118644
I Won't Be Worried	2.519337017	7.387755102
Mehmet Akif Ersoy	2.588235294	9.322580645
Çanakkale is Impassable, Mustafa Kemal is Invincible	2.909090909	10.54166667
Healing Power: Love	2.507658643	6.924242424
Patient Visit	2.370056497	7.375
The Farmer and His Sons	2.577319588	6.807017544
What is Science?	2.661073826	9.933333333
Science Behind the Olympics	2.850855746	13.63333333
Car Flies Away	2.848101266	7.9
The Mathematics Professor and His Amazing Rings	2.924050633	13.94117647
Hello! Is This Birch Tree?	2.72611465	10.46666667
How Does the Sun Work?	2.663522013	8.594594595
What is This Climate Change?	2.98603352	11.93333333
Anatolian Sisters (Anatolian Women's Union)	2.873076923	13.68421053
World's First Shopping Mall: Grand	2.688925081	11.37037037

Bazaar		
Modern Cat Fildir: Overnight Guest	2.61443662	8.606060606
Keloğlan's Bean	2.530612245	7.84
Says That:	2.444029851	10.30769231
My Friend April 23	2.477272727	6.769230769
Five Stones and Two Walnut Tickets	2.900641026	8.432432432
How Do Kites Fly?	2.656765677	8.657142857
Don't Panic, Remember First Aid!	2.832876712	14.03846154
Tahini Grandpa	2.501039501	8.745454545
Let's Go Nature Walking!	2.648106904	15.48275862
Average	2.675104667	9.39945122

According to the findings in Table 5, while the average word lengths in texts in the 4th grade Turkish textbook vary between 2.37 and 2.91, the average sentence lengths vary between 6.77 and 15.48. Considering that the average word length in Turkish is 2.60 (Ateşman, 1997; Bezirci and Yılmaz, 2010), it is observed that the texts 'Çanakkale is Impassable, Mustafa Kemal is Invincible', 'The Mathematics Professor and His Amazing Rings', 'Science Behind the Olympics', and 'Anatolian Sisters' have above-average word lengths. Furthermore, considering that the average sentence length in Turkish is around 9 words (Ateşman, 1997), it can be said that the texts 'Let's Go Nature Walking!', 'Don't Panic, Remember First Aid!', and 'Anatolian Sisters' have above-average sentence lengths.

Table 6

Average Word-Sentence Lengths of Texts by Grade Levels

Grade Levels	Average Word Length	Average Sentence Length
1st Grade	2.722575258	7.627580857
2nd Grade	2.502840496	8.062437978
3rd Grade	2.661684686	9.30144116
4th Grade	2.675104667	9.39945122

According to the findings in Table 6, it can be said that the average word lengths in Turkish textbooks are similar across grade levels. The longest words are found at the first-grade level, while the shortest ones are at the 2nd-grade level. When looking at the average sentence lengths in Turkish textbooks, no major change is observed. It can be said that there is a gradual increase in sentence length from first grade to fourth grade.

3.2. Do the word-sentence lengths in primary school (1st, 2nd, 3rd, and 4th grade) Turkish textbooks differ according to grade level?

Table 7

Analysis Results Regarding the Differences in Word Lengths in Texts According to Grade Level

	Grade Level	n	Average	X^2	df	Sig.	U-test
Word Length	1th grade	10	50,60				
	2nd grade	19	25,26	11,368	3	0,010*	1-2
	3rd grade	24	43,71				2-3
	4th grade	27	44,63				2-4

*p<0.05

According to the Kruskal Wallis H test results conducted to determine whether word lengths in texts differ by grade level, the difference in word lengths across grade levels was found to be statistically significant at a 95% confidence level (p<0.05). Mann Whitney U test was performed to determine which groups caused the significant difference. According to the U test results, significant differences in word lengths were found between 1st and 2nd grades, 2nd and 3rd grades, and 2nd and 4th grades. While the word length of texts in first grade is greater than second grade, the word length of texts in second grade is less than those in third and fourth grades.

Table 8

Analysis Results Regarding the Differences in Sentence Lengths in Texts According to Grade Level

	Grade Level	n	Average	X^2	df	Sig.	U-test
Word Length	1th grade	10	28,50				1-3
	2nd grade	19	30,32	9,987	3	0,019*	1-4
	3rd grade	24	45,54				2-3
	4th grade	27	47,63				2-4

*p<0.05

According to the Kruskal Wallis H test results conducted to determine whether sentence lengths in texts differ by grade level, the difference in sentence lengths across grade levels was found to be statistically significant at a 95% confidence level (p<0.05). Mann Whitney U test was performed to determine which groups caused the significant difference. According to the U test results, significant differences in sentence lengths were found between 1st and 3rd grades, 1st and 4th grades, 2nd and 3rd grades, and 2nd and 4th grades. While the sentence length of texts in first grade is shorter than those in third and fourth grades, the sentence length of texts in second grade is shorter than those in third and fourth grades.

3.2. What are the readability scores and levels of texts in primary school (1st, 2nd, 3rd, and 4th grade) Turkish textbooks?

Table 9

Readability Scores and Levels of 1st Grade Texts

1st Grade Texts	Ateşman Readability		Çetinkaya-Uzun Readability		Bezirci-Yılmaz Readability	
	Points	Level	Points	Level	Points	Level
Dream Traveler	78,79020221	Easy	47,25474632	Educational Reading	8,803176526	High School
Şirin's Bird Paintings Exhibition	83,27469828	Easy	49,28003448	Educational Reading	5,288371678	Elementary School
Fascinating Magnifying Glass	59,15768959	Medium	34,01308289	Educational Reading	9,510423927	High School
Going to Teknofest	64,70116071	Medium	38,7601369	Educational Reading	10,1401293	High School
Sky School	67,51112047	Medium	39,65127742	Educational Reading	10,50962852	High School
My Father's Toy Chest	60,6406271	Medium	34,76198768	Educational Reading	8,819986432	High School
Celebrating Holiday	71,63087311	Easy	40,57745319	Educational Reading	7,706925726	Elementary School
Our Rights	61,33434745	Medium	34,79836214	Educational Reading	9,138807945	High School
The Sun Always Shines for Hard Workers	69,24586957	Easy	43,25393478	Educational Reading	12,73607082	High School
Picnic Area	79,08894129	Easy	44,29954179	Educational Reading	4,396587926	Elementary School
Average	69,53755298	Orta	40,66505576	Educational Reading	8,70501088	Elementary School

According to the findings in Table 9, it has been determined that the texts in the 1st grade Turkish textbook have an average Ateşman Readability Score of 69.53, an average Çetinkaya-Uzun Readability Score of 40.66, and an average Bezirci-Yılmaz Readability Score of 8.70. In terms of Ateşman Readability Level, 7 of the texts in the 1st grade Turkish textbook were found to be 'medium' and 5 were 'easy'. In terms of Çetinkaya-Uzun Readability Level, 12 were determined to be at the 'educational reading' level. As for Bezirci-Yılmaz Readability, 4 were found to be at 'primary school' level and 8 at 'high school' level.

Table 10

Readability Scores and Levels of 2nd Grade Texts

2nd Grade Text	Ateşman		Çetinkaya-Uzun		Bezirci-Yılmaz	
	Readability		Readability		Readability	
	Points	Level	Points	Level	Points	Level
Proud Rose	92,03568994	Very easy	54,59557846	Independent Reading	5,224124041	Elementary School
Model Child	74,68580557	Easy	43,60196117	Educational Reading	7,216761934	Elementary School
I Love My Elders	87,63137743	Easy	51,51535255	Independent Reading	6,592966482	Elementary School
Ata's Life	88,98355625	Easy	51,31501923	Independent Reading	3,851423251	Elementary School
How Do I Win?	66,33708839	Medium	39,41371727	Educational Reading	9,507925688	High School
Kite Season	84,5368204	Easy	49,64989894	Educational Reading	5,249371541	Elementary School
Chubby	64,33790146	Medium	40,01946776	Educational Reading	11,28254552	High School
Space Explorer Gökay	77,72142016	Easy	46,19598713	Educational Reading	7,881924865	Elementary School
Cheerful Explains Nature	74,39030193	Easy	43,94641401	Educational Reading	8,095157132	High School
Comet and the North Star	74,63959967	Easy	43,65084617	Educational Reading	7,033033815	Elementary School
And Basketball!	70,1995	Easy	43,3687	Educational Reading	11,27265718	High School
Why Should We Have Breakfast?	64,56278295	Medium	41,22887519	Educational Reading	12,43590166	High School
White Mustaches	84,65018307	Easy	50,89482197	Independent Reading	5,702551414	Elementary School
Alexander Graham Bell	61,12773202	Medium	38,34146642	Educational Reading	13,05060012	Bachelor's degree
Stubborn Shadows	71,86288352	Easy	42,26242519	Educational Reading	7,92842175	High School
Letter	93,80877098	Very easy	54,84513668	Independent Reading	4,008536411	Elementary School
Trojan Horse	76,25177399	Easy	45,40565177	Educational Reading	8,354317931	High School
Library	73,57723237	Easy	42,45845978	Educational Reading	7,012755007	Elementary School
Who Understands the Language of Cakes?	86,03755922	Easy	50,3982988	Independent Reading	5,619901289	Elementary School
Average	77,23041996	Easy	45,95305676	Educational Reading	7,75373037	Elementary School

According to the findings in Table 10, it has been determined that the texts in the 2nd grade Turkish textbook have an average Ateşman Readability Score of 77.23, an average Çetinkaya-Uzun Readability Score of 45.95, and an average Bezirci-Yılmaz Readability Score of 7.75. In terms of

Ateşman Readability Level, 2 of the texts in the 2nd grade Turkish textbook are at 'very easy' level, 13 at 'easy' level, and 3 at 'medium' level. In terms of Çetinkaya-Uzun Readability Level, 9 texts were found to be at 'educational reading' level, and 4 texts at 'independent reading' level. As for Bezirci-Yılmaz Readability Level, it was determined that 9 texts are at 'primary school' level and 5 texts at 'high school' level.

Table 11

Readability Scores and Levels of 3rd Grade Texts

3rd Grade Textbooks	Ateşman		Çetinkaya-Uzun		Bezirci-Yılmaz	
	Readability		Readability		Readability	
	Points	Level	Points	Points	Level	Points
What is a Dream?	55,31257339	Medium	32,25246922	Frustration Level	12,6277145	Lise
World's Highest Book Mountain	65,33381459	Medium	40,5014306	Educational Reading	10,42475468	Lise
Little Nezahat	70,15082729	Easy	41,77716365	Educational Reading	8,477594551	İlköğretim
Atatürk's Children	64,77693878	Medium	38,1743323	Educational Reading	8,27230527	İlköğretim
National Anthem	61,02535591	Medium	38,66814709	Educational Reading	13,85285357	Lisans
March 18 Martyrs' Memorial Day	51,20967784	Medium	32,03560438	Frustration Level	17,26932342	Akademik
Who Will Save This Bear?	77,79864827	Easy	48,00378583	Educational Reading	7,370456297	İlköğretim
Field Mouse and City Mouse	68,27121983	Medium	42,34239686	Educational Reading	10,47263365	Lise
Atatürk and Compassion	67,2098039	Medium	42,07485147	Educational Reading	9,883786257	Lise
One-Winged Owl Tayga	78,56902703	Easy	47,22841171	Educational Reading	7,434807029	İlköğretim
Stones in the Box	86,32835449	Easy	51,5151027	Independent Reading	5,563062044	İlköğretim
Big Smile	63,65806557	Medium	37,22469727	Educational Reading	10,71709952	Lise
Garden of Hearts	79,16747845	Easy	47,92334353	Educational Reading	8,361311108	İlköğretim
Sunflower and Daisy	67,07625836	Medium	40,34427477	Educational Reading	8,78563763	İlköğretim
Future Professions	48,99785714	Hard	30,27615238	Frustration Level	16,78439669	Lise
Webbed Learning to Swim	80,2043962	Easy	46,04644048	Educational Reading	5,803191782	İlköğretim
Self-Confidence and Mimar Sinan	70,96589766	Easy	41,66898412	Educational Reading	8,624370885	İlköğretim
Turkey's Most Beautiful Houses	57,5700626	Medium	37,30754802	Educational Reading	14,92471593	Akademik
Meerkat Grandmothers Give Concert	66,79653743	Medium	40,34917567	Educational Reading	10,55233416	Lise
Color of the Sky	66,65917027	Medium	38,80948773	Educational Reading	8,637818059	İlköğretim

Love is a Bird Magazine	81,36700586	Easy	47,0115354	Educational Reading	5,899751148	İlköğretim
Traveling Water Drop	76,12402462	Easy	44,12999011	Educational Reading	6,718326593	İlköğretim
Swallows in Feşmekan Town	62,02840907	Medium	35,70754668	Educational Reading	9,026228224	Lise
Shapes in the Sky	56,15994686	Medium	33,55754473	Frustration Level	13,60560459	Lisans
Average	67,61505631	Medium	40,6221007	Educational Reading	10,00375323	Lise

According to the findings in Table 11, it has been determined that the texts in the 3rd grade Turkish textbook have an average Ateşman Readability Score of 67.62, an average Çetinkaya-Uzun Readability Score of 40.62, and an average Bezirci-Yılmaz Readability Score of 10.00. In terms of Ateşman Readability Level, 1 of the 3rd grade texts is at 'very easy' level, 15 at 'easy' level, 9 at 'medium' level, and 1 at 'difficult' level. In terms of Çetinkaya-Uzun Readability Level, 11 texts were found to be at 'educational reading' level, and 5 texts at 'independent reading' level. As for Bezirci-Yılmaz Readability Level, it was observed that 2 texts are at 'high school' level, 2 texts at 'academic' level, and 14 texts at 'primary school' level.

Table 12

Readability Scores and Levels of 4th Grade Texts

4th Grade Textbooks	Ateşman		Çetinkaya-Uzun		Bezirci-Yılmaz	
	Readability		Readability		Readability	
	Points	Level	Points	Points	Level	Points
Library in Our Home	63,61296037	Medium	37,71934242	Educational Reading	14,08403791	Academic
What Are Books For?	79,7737344	Easy	46,78300614	Educational Reading	6,793360957	Primary School
The Book Without a Story	73,30551896	Easy	43,81927998	Educational Reading	8,081925742	Primary School
I Won't Be Worried	78,32859454	Easy	46,17947875	Educational Reading	6,906356439	Primary School
Mehmet Akif Ersoy	70,51071157	Easy	42,51030361	Educational Reading	9,529241649	High School
Çanakkale Cannot Be Passed, Mustafa Kemal Cannot Be Defeated	54,43852273	Medium	32,98849621	Frustration Level	10,88947074	High School
Healing Power: Love	80,00754128	Easy	46,93303544	Educational Reading	5,986851985	Primary School
Hospital Visit	84,35923023	Easy	50,07121681	Independent Reading	6,269056365	Primary School
The Farmer and His Sons	77,51486978	Easy	45,23658184	Educational Reading	6,435381386	Primary School
What is Science?	65,99035906	Medium	40,02440783	Educational Reading	10,60293146	High School
The Science Behind Olympics	48,70887042	Difficult	31,49984507	Frustration Level	19,64747538	Academic
Car Flies Away	63,78353165	Medium	37,13849241	Educational Reading	9,880032051	High School
The Ordinary Professor of Mathematics and His Amazing Rings	44,96479523	Difficult	29,29881385	Frustration Level	20,20471355	Academic

Hello! Is This Beech Tree?	61,98534395	Medium	37,81632527	Educational Reading	10,61018274	High School
How Does the Sun Work?	69,38611125	Easy	41,26070211	Educational Reading	8,370178202	Primary School
What is This Climate Change?	47,71510335	Difficult	29,63768026	Frustration Level	18,23388604	Academic
Anatolian Sisters (Anatolian Women's Union)	47,68334514	Difficult	30,87298158	Frustration Level	17,01449602	Academic
World's First Shopping Mall: Grand Bazaar	61,12076819	Medium	37,90527428	Educational Reading	12,81909611	High School
Modern Cat Fildir: Overnight Guest	71,32819062	Easy	42,52515071	Educational Reading	8,299305734	Primary School
Keloğlan's Bean	76,69525306	Easy	45,44733959	Educational Reading	6,712451316	Primary School
It Says:	73,73302382	Easy	45,30122704	Educational Reading	7,744858955	Primary School
My Friend April 23	81,63287587	Easy	47,87319056	Educational Reading	6,181399853	Primary School
Five Stones and Two Walnut Tickets	60,28309815	Medium	35,25614977	Educational Reading	10,8430115	High School
How Do Kites Fly?	69,49429609	Easy	41,37554465	Educational Reading	9,678724406	High School
Don't Panic, Remember First Aid!	48,37379347	Difficult	31,57368672	Frustration Level	19,29675602	Academic
Tahini Grandpa	75,52010168	Easy	45,33665012	Educational Reading	7,813222952	Primary School
Let's Go Hiking!	52,02730512	Medium	34,97288726	Educational Reading	18,18606829	Academic
Average	66,82010233	Medium	40,17818789	Educational Reading	10,52781313	High School

According to the findings in Table 12, it has been determined that the texts in the 4th grade Turkish textbook have an average Ateşman Readability Score of 66.82, an average Çetinkaya-Uzun Readability Score of 40.18, and an average Bezirci-Yılmaz Readability Score of 10.53. In terms of Ateşman Readability Level, 3 texts are at 'very easy' level, 18 texts at 'easy' level, 8 texts at 'medium' level, and 2 texts at 'difficult' level. Regarding Çetinkaya-Uzun Readability Level, it was observed that 20 texts are at 'educational reading' level, 1 text at 'independent reading' level, and 5 texts at 'frustration level'. In terms of Bezirci-Yılmaz Readability Level, it was determined that 2 texts are at 'academic' level, 3 texts at 'high school' level, and 17 texts at 'primary school' level.

3.4. Do the readability levels of texts in primary school (1st, 2nd, 3rd, and 4th grade) Turkish textbooks differ according to formulas?

Table 13

Scores and levels of texts in primary school Turkish textbooks according to various readability formulas

Grade Levels	Ateşman Readability		Çetinkaya-Uzun Readability		Bezirci-Yılmaz Readability	
	Points	Level	Points	Düzeyi	Puanı	Düzeyi
1st Grade	69,53755298	Medium	40,66505576	Educational Reading	8,70501088	İlköğretim
2nd Grade	77,23041996	Easy	45,95305676	Educational	7,75373037	İlköğretim

				Reading		
3rd Grade	67,61505631	Medium	40,6221007	Educational Reading	10,00375323	Lise
4th Grade	66,82010233	Medium	40,17818789	Educational Reading	10,52781313	Lise

According to the findings in Table 13, the readability scores and levels of texts at the same grade level show variation according to different formulas. While the first-grade texts are appropriate for their grade level according to the Bezirci-Yılmaz Readability Level, they are at a more difficult level according to the Ateşman Readability Level. Additionally, while the readability levels of grades show no change according to the Çetinkaya-Uzun Readability Level, there are differences in the readability levels of texts in the other two formulas. All these situations reveal that the same texts vary in terms of readability levels according to different readability formulas.

4. CONCLUSION AND RECOMMENDATIONS

The main purpose of this research is to examine the word and sentence lengths along with readability levels of texts in primary school (1st, 2nd, 3rd, and 4th grade) Turkish textbooks. In this context, the Turkish textbooks published by the Ministry of National Education that began to be used in the 2024-2025 academic year were examined. First, the average number of syllables and words in the texts of these books was determined, then Ateşman (1997), Çetinkaya-Uzun (2010), and Bezirci-Yılmaz (2010) readability formulas were applied to determine readability scores and levels. According to the findings obtained from the analysis, the average word lengths in Turkish textbooks at primary school level were found to be 2.72, 2.50, 2.66, and 2.67 respectively by grade level. Additionally, the average sentence lengths were determined to be 7.62, 8.06, 9.30, and 9.39 respectively by grade level. It has been stated that the average word length in Turkish is 2.60 (Ateşman, 1997; Bezirci and Yılmaz, 2010) and the average sentence length is 9-10 words (Ateşman, 1997). Based on these values, it was determined that the words in first, third, and fourth-grade texts were above average in length, while sentences had average length. It is quite striking that the longest words are found in the 1st-grade book. Especially in these years when formal reading instruction begins, students are expected to read shorter and familiar words (Zorbaz, 2007). Studies in reading science indicate that using texts containing short and familiar words that students can easily pronounce in the initial years of reading instruction will facilitate reading instruction (Martin and Hiebert, 1999). Considering this, it can be said that the contribution of texts at other grade levels, particularly the word lengths in current 1st-grade books, to students' reading journey will not be at the expected level.

When the findings are examined in terms of sentence length, it is observed that average sentence lengths increase progressively from first to fourth grade. This result is consistent with the findings of Acarlar, Ege, and Turan's (2002) research. The study determined a linear relationship between individuals' ages and sentence lengths. However, when average sentence lengths are closely examined at the grade level, it was found that the increase from first to fourth grade was minimal. Yet, the purpose of texts in first grade is not the same as those in fourth grade in terms of reading instruction. The aim in first grade is to teach students the mechanical part of language. Therefore, first-grade texts should have a structure that allows students to develop their decoding skills. For this reason, first-grade texts are expected to consist of short sentences containing frequently used words in daily life.

Additionally, the Kruskal Wallis H test was applied to determine whether word and sentence lengths differ by grade level. Analysis results revealed that word and sentence lengths show statistically significant differences according to grade level. Nevertheless, texts consisting of short sentences in textbooks used in the early years of school will contribute more to reading instruction.

When examining the readability levels of texts in primary school Turkish textbooks, it was observed that they are generally at medium level according to Ateşman Readability Level and at educational level according to Çetinkaya-Uzun Readability Level. According to Bezirci-Yılmaz Readability Level, it was determined that texts in first and second-grade Turkish textbooks are at primary school level, while texts in third and fourth grade are at high school level. This situation revealed that readability scores and levels of texts at the same grade level vary according to different formulas. For example, while the levels of 3rd-grade texts are "medium" according to Ateşman's (1997) formula, they appear to be at a more difficult level according to Bezirci-Yılmaz's (2010) formula. Additionally, when texts are examined according to Çetinkaya-Uzun's (2010) formula, no differences are seen in readability levels based on grade level. However, when the same situation is examined according to the other two formulas, there are variations in the readability levels of texts based on grade level. This finding leads us to uncertainty regarding whether the texts are appropriate at the grade level and how well the readability formulas serve their purpose.

One of the main reasons for the variation in readability levels of texts in Turkish textbooks according to formulas could be the formal characteristics of the texts. The presence of multi-syllabic words and very long sentences prevents the alignment of texts' readability levels with grade levels. Additionally, when texts are examined according to Ateşman (1997) and Çetinkaya-Uzun (2010) formulas, it is observed that readability levels do not progressively increase based on grade level. However, text difficulty is expected to increase as grade level rises. This situation indicates that the texts in the current Turkish textbook are not appropriate in terms of readability for their grade levels. This finding parallels similar research findings in the literature (Bağcı Dağdeviren and Küçüktepe, 2022; Zorbaz, 2007). The mismatch between texts' readability levels and grade levels undermines students' reading skill acquisition processes (Durukan, 2014). The presence of multi-syllabic words and long sentences causes students to struggle in decoding written language, thus preventing them from reading the text fluently. The inability to read the text fluently not only risks comprehension (Rasinski, 2017) but also negatively affects students' attitudes and motivation towards reading skills (Guthrie and Wigfield, 2000).

Another reason for the variation in texts' readability levels across formulas could be the differences in how these formulas are calculated. For example, while Ateşman (1997) uses five different levels in readability assessment, Bezirci-Yılmaz (2010) uses a narrower range. At this point, it can be suggested to develop new readability formulas that can measure both quantitative and qualitative characteristics of texts based on Turkish's orthographic structure. Additionally, in line with the findings from the current research, it can be recommended that the readability of texts in textbooks should progress from easy to difficult based on grade levels in terms of reading instruction. It is suggested that textbook authors should also consider readability level during the writing phase.

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