



A STUDY ON DEVELOPING A READING COMPREHENSION TESTⁱ

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Abstract:

The purpose of this study is to develop a valid and reliable reading comprehension test to evaluate the students' reading comprehension skills. The learning outcomes in reading in the Turkish Lesson Curriculum were taken into consideration in developing the achievement test and the test items were created based on these learning outcomes. A table of specifications was created to ensure the content validity of the test and two types of achievement tests, that is, narrative and informative achievement tests were obtained. Each test was administered to a total of 100 7th graders in ElazıŐ province. Some changes were made to the items in line with the item analyzes and expert opinions. By taking into consideration the content validity of the tests, the items with low discrimination and difficulty coefficients were identified and removed from the test. Based on the item analysis, two types of Reading Comprehension Test were obtained, that is, narrative and informative tests. The reliability of the achievement tests was computed using the Kuder-Richardson (KR-20) formula. The KR-20 reliability coefficients of RCTIT-1 (Reading Comprehension Test for Informative Texts), RCTIT-2, RCTNT-1 (Reading Comprehension Test for Narrative Texts), and RCTNT-2 were found to be .70, .70, .71, and .72, respectively. As a result of the study, a valid and reliable reading comprehension test to be used in evaluating the students' reading comprehension skills was obtained.

Keywords: reading comprehension, achievement test, secondary school.

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1. Introduction

Reading is a skill that existed before the invention of the printing press in human history. The troglodytes read and tried to understand the universe to survive (Blaha & Bennett, 1993). Today, reading has been a key power in increasing the development level of societies and introducing the intellectual and thinking individuals to the society. Needed by the individuals throughout their lives, this skill, on the one hand, contributes positively to the development levels of societies and, on the other hand, helps to raise the individuals who can see life with different dimensions. According to Secretary's Commission on Achieving Necessary Skills (SCANS, 1991), reading skill is one of the basic skills that contribute to the development of individuals' skills of developing social relations, using resource, and using knowledge and technology.

The fact that reading is a process of thinking and based on mental structuring reveals its relationship with reading comprehension. Reading comprehension is the ultimate objective of the reading process. In most of the definitions about reading, it is seen that the relationship between reading and comprehension is pointed out and it is emphasized that reading is a skill based on comprehension. "Reading" and "comprehension" are seen as two different efforts; but actually, they are connected with a cause-effect relationship (G ng r, 2005). Reading comprehension is a process of establishing an interaction by integrating the reader's prior knowledge and experience with the text (Pardo, 2004). In this process, it is expected that the reader comprehends, questions, and criticizes what she/he reads (Aytan, 2015). The familiarity with the word being read helps the reader determine the meaning by using the mental dictionary created earlier. The words and sentences interpreted in the mind are placed in short-term memory and the reader tries to get the meaning with the help of her/his existing knowledge. Reading and comprehension are realized in this way (Akyol, 2005). Therefore, reading comprehension can only be achieved by means of reaching a certain amount of knowledge accumulation ( zbek, 1996).

In the process of reading, the reader interacts with the text. Writer creates the text by adding her/his prior knowledge, experience, purpose, and cultural side. The reader, on the other hand, reinterprets the text in the reading process by using her/his prior knowledge, experience, purpose, and cultural background. From this aspect, every reader is different because she/he has different experiences. The important thing is whether the reader interprets correctly ( lper, 2010; Pardo, 2004). Reading comprehension is a process that is formed by the interaction of the reader, text, socio-cultural structure, and context. Pardo (2004) explains this process as follows:

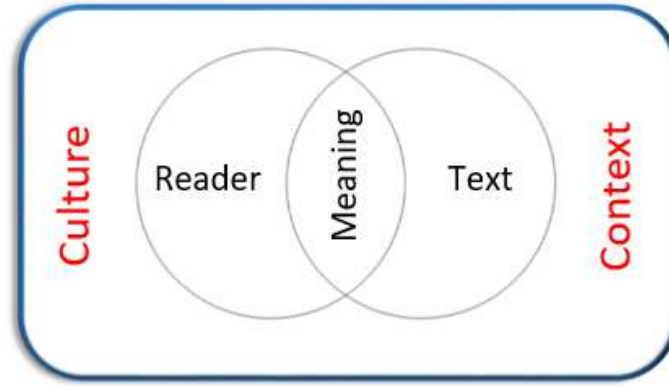


Figure 1: Components of Reading Comprehension

In this process, where multiple factors are involved, to what extent the reader reaches the meaning can be measured by the measurement and evaluation tools. At this point, G cer (2008) points out the importance of the measurement and evaluation studies in getting to know the students and identifying their personal differences, understanding the course of the learning process and directing the works to be done, identifying the difficulties faced by the students in reading comprehension, helping students see what they are able to accomplish, and guiding them in line with their interests and wishes.

By means of the works carried out in the measurement and evaluation process, on the one hand, the cognitive learning levels of students are monitored; and on the other hand, they are helped to structure their knowledge and skills. That is, the students have the opportunity to reinforce their existing knowledge and skills as well as relaying their knowledge (Karatay & Dilekçi, 2019). There have been some studies on developing reading comprehension tests in the literature (Yıldız & Akyol, 2011; Belet & Yaşar, 2007). As asserted by Balcı (2013), to what extent the items in a measurement tool and the behaviors related to these items are measured should be determined by content validity. By means of creating the table of specifications and ensuring the content validity, it is checked whether the items can measure the intended behaviors. In this study, the table of specifications was created, and it was clearly stated which question was related to which specific outcome. By this means, this study aimed to contribute to the literature and to add variety to the informative and narrative reading comprehension tests. From this aspect, this study is expected to shed light on new studies to be carried out.

2. Purpose of the study

The purpose of this study is to develop a reliable and valid measurement tool to be used in determining the reading comprehension level of students. The measurement tool was prepared for two types of texts: "Reading Comprehension Test for Informative Texts" and "Reading Comprehension Test for Narrative Texts."

3. Method

In this study, it was aimed to develop a reliable and valid measurement tool that measures the reading comprehension skills of 7th graders. In order to develop the reading comprehension tests, the relevant literature was reviewed (Crocker & Algina, 1986; Turgut & Baykul, 2015) and by taking into consideration the studies in the literature, the following steps were followed:

Stage 1. Literature review: In the process of developing reading comprehension tests, first of all, the relevant literature was reviewed and information was collected about the preparation process of the tests measuring the reading comprehension skill. The literature on the multiple-choice question writing was also reviewed (Erkuş, 2014; Şeker & Gençdoğan, 2014; Sönmez & Alacapınar, 2016).

Table 1: Text Evaluation Data Obtained from the Subject Matter Experts

Texts	1. Expert	2. Expert	3. Expert	4. Expert	5. Expert	6. Expert	7. Expert	8. Expert	9. Expert	10. Expert	Average Score
Informative Texts Scores											
1. <i>O Benim Sadık Yârimdir...</i> (It is my loyal lover...)	33	57	53	56	49	53	52	52	54	53	51.2
2. <i>Kitap Saygısı</i> (Book Respect)	51	57	50	57	57	55	52	54	57	54	54.4
3. <i>Okumak</i> (Reading)	57	52	46	57	56	54	56	53	53	57	54.1
4. <i>Mutluluk Nedir?</i> (What is happiness?)	57	57	49	53	54	56	44	54	53	52	52.9
5. <i>Ev</i> (Home)	56	57	51	57	56	54	55	50	51	55	54.2
6. <i>Erken Kalkmak, Geç Kalkmak</i> (Getting up early, getting up late)	57	57	51	53	56	55	52	53	57	56	54.7
Narrative Texts Scores											
1. <i>Kütüphaneler</i> (Libraries)	53	57	39	50	50	57	52	49	41	53	50.1
2. <i>Doğanın Sesini Duymak</i> (Hearing the Voice of Nature)	51	50	51	54	51	55	56	54	50	56	52.8
3. <i>Balıkçıl Kuşu</i> (Heron)	51	57	43	49	49	49	49	56	50	47	50
4. <i>Arkadaşım</i> (My Friend)	57	57	53	51	50	50	51	55	54	56	53.4
5. <i>Kış Mevsimi</i> (Winter)	52	57	42	38	51	53	38	55	50	50	48.6
6. <i>Kız Kalesi</i> (Maiden's Castle)	55	57	50	52	49	56	50	57	53	56	53.5

Stage 2. Selection of the texts to be used in the practice: In selecting the texts, it was taken into consideration that the texts suited the students' interests, needs, and age levels. In order to determine these texts, first of all, the Turkish textbooks taught in Elazığ province were reviewed. Then, the textbooks published by MEB in previous years were reviewed and a text list was created. Based on the criteria such as grade level, length of text, and suitability to the child; a total of 12 texts (6 narrative and 6 informative texts) were identified. Then, with reference to Turkish Course Curriculum (TCC), a text

evaluation form consisting of 19 items was created. The texts were presented to 10 subject matter experts to receive their opinions on the texts. In their evaluation, the experts were asked to give a score from 1 to 3 for the texts as follows: "Appropriate", "Partially Appropriate", and "Inappropriate."

Based on the opinions of the experts, "*Erken Kalkmak Ge Kalkmak*" and "*Kitap Saygısı*" were selected as the informative text and "*Kız Kalesi*" and "*Arkadařım*" as the narrative text to determine the reading comprehension level of the students. These texts were selected from the books published by Turkish Education Board for the 7th graders in the primary education.

Stage 3. Creating the item pool: In this phase, first of all, the learning outcomes in reading were identified and a table of specifications was created, and then an item pool was prepared for the items to be included in the test. The learning outcomes in reading in the Turkish Lesson Curriculum were taken into consideration in preparing the items to be included in the reading comprehension test. The learning outcomes identified based on the analyzes are given in the Table 2:

Table 2: The Learning Outcomes in Reading in the Turkish Lesson Curriculum

Reading Outcomes
1. Chooses the title/titles suitable for the content of the text.
2. Identifies the keywords in the text.
3. Identifies the subject/main idea of the text.
4. Identifies the story elements in the text and knows the order of occurrence of events.
5. Answers the questions about the text.
6. Makes inferences about what she/he reads.
7. Realizes the implicit meanings in what she/he reads.
8. Interprets the content of the text.
9. Infers the meaning of words and phrases that she/he does not know from the context.
10. Interprets the contribution of transition and connection expressions in the text to the meaning.
11. Identifies the forms of expression in the text.

In preparing the item pool, special attention was paid to ensure that the items were oriented toward the comprehension skills such as identifying the purpose-cause-effect relationship, finding the suitable title for the text, identifying the main idea of the text, and identifying the type of the text. After the outcomes were determined, the study proceeded to the question-writing phase. By taking into consideration the reading outcomes in question, a total of 58 test items were prepared for the narrative and informative texts.

Stage 4. Reviewing the items and receiving the expert opinion: In this phase, in order to test the comprehensibility, the questions were administered to the five 7th graders who would not be included in the study. By this means, it was tried to determine the comprehensibility of the items. Necessary changes were made to the items in line with the feedback given by the students. In order to determine whether the items served the intended purpose, the subject matter experts were asked for their opinion. The items were

presented to a total of 10 experts; of whom, 4 were in the field of Turkish teaching, 3 in the field of curriculum and teaching, and 3 in the field of measurement and evaluation. The experts examined the test items and made some suggestions. Some changes were made to the items in line with the suggestions of the experts. The changes made in the reading comprehension test in line with the suggestions of the experts were as follows:

- In order to prevent the long lines from affecting the readability of the text negatively, a new design was created by using a two-column page layout.
- The notched font used in the test was replaced by a new font so as not to strain the eyes of the reader.
- Some changes were made to the sentence structures of the questions.

Stage 5. Administering the test: The draft achievement test was administered to 100 7th graders studying in a secondary school in Elazığ province. In the item analysis phase; the difficulty index, variance, discrimination index, standard deviation, and reliability were computed for the items using Microsoft Excel. In determining the items to be removed based on the discrimination index, the following item discrimination range was applied:

- If lower than .20 - poor item, it should be discarded from the test.
- If within the range of .20-.29 - the item should be reviewed.
- If within the range of .30-.39 - the item is quite good and acceptable.
- If equal and higher than .40 - the item is very good and acceptable (B y k zt rk et al., 2014).

By taking into consideration the content validity of the tests, the items of which were analyzed as a result of the pilot scheme; the items with a discrimination coefficient less than .20 were identified and discarded from the test. After the items to be included into the test were determined; the standard deviation, difficulty, and the reliability of the test (by KR-20 test) were computed.

4. Findings

In line with the opinions received from the experts, the reading comprehension tests for informative texts-1 (12 questions), informative texts-2 (14 questions), narrative texts-1 (10 questions), and narrative texts-2 (10 questions) were obtained. For the items in the reading comprehension test, the correct answers were coded as "1" and the wrong answers were coded as "0". The item analyses of the tests were carried out separately. The difficulty and discrimination values of the items in the achievement test are given in the Table 3.

When the Table 3 is examined, it is seen that the item difficulty values of the test vary within the range of .39-.66 and the item discrimination values vary within the range of .30-.64. The highest score to get on the Informative-1 test is 12.

Table 3: Item and Test Statistics of the Informative Text-1

Question No	Difficulty Index	qj=1-pj	Variance	Standard Deviation	Discrimination Coefficient	Reliability
1.	.60	.40	.24	.49	.58	.28
2.	.54	.46	.24	.50	.52	.26
3.	.45	.55	.24	.50	.30	.15
4.	.61	.39	.23	.49	.64	.31
5.	.64	.36	.23	.48	.43	.20
6.	.44	.56	.24	.49	.43	.21
7.	.65	.35	.22	.47	.58	.28
8.	.52	.48	.25	.50	.52	.26
9.	.65	.35	.22	.47	.40	.19
10.	.66	.34	.22	.47	.52	.24
11.	.39	.61	.23	.49	.43	.21
12.	.64	.36	.23	.48	.52	.25

Standard Deviation of the Test (S): 2.83, Difficulty of the Test (P): .56, Reliability of the Test (KR-20): .70

When the Table 4 is examined, it is seen that the item difficulty values of the test vary within the range of .41-.76 and the item discrimination values vary within the range of .44-.73. The highest score to get on the Informative-2 test is 14.

Table 4: Item and Test Statistics of the Informative Text-2

Question No	Difficulty Index	qj=1-pj	Variance	Standard Deviation	Discrimination Coefficient	Reliability
1.	.55	.45	.24	.50	.50	.25
2.	.76	.24	.18	.42	.55	.23
3.	.50	.50	.25	.50	.47	.23
4.	.70	.30	.21	.46	.50	.23
5.	.44	.56	.24	.49	.47	.23
6.	.59	.41	.24	.49	.70	.34
7.	.72	.28	.20	.45	.67	.30
8.	.66	.34	.22	.47	.73	.35
9.	.57	.43	.24	.49	.52	.26
10.	.64	.36	.23	.48	.61	.29
11.	.41	.59	.24	.49	.44	.21
12.	.59	.41	.24	.49	.61	.30
13.	.68	.32	.21	.46	.64	.30
14.	.53	.47	.24	.50	.50	.25

Standard Deviation of the Test (S): 3.06, Difficulty of the Test (P): .59, Reliability of the Test (KR-20): .70

When the Table 5 is examined, it is seen that the item difficulty values vary within the range of .50-.88 and the item discrimination values vary within the range of .38-.67 in the Narrative-1 test. The highest score to get on the Narrative-1 test is 10.

Table 5: Item and Test Statistics of the Narrative Text-1

Question No	Difficulty Index	qj=1-pj	Variance	Standard Deviation	Discrimination Coefficient	Reliability
1.	.65	.35	.22	.47	.45	.21
2.	.54	.46	.24	.50	.77	.38
3.	.68	.32	.21	.46	.49	.23
4.	.74	.26	.19	.44	.59	.26
5.	.78	.22	.17	.41	.49	.20
6.	.72	.28	.20	.45	.52	.23
7.	.88	.12	.10	.32	.38	.12
8.	.50	.50	.25	.50	.70	.35
9.	.66	.34	.22	.47	.59	.28
10.	.62	.38	.23	.48	.73	.35

Standard Deviation of the Test (S): 2.47, Difficulty of the Test (P): .67, Reliability of the Test (KR-20): .71

When the Table 6 is examined, it is seen that the item difficulty values vary within the range of .46-.81 and the item discrimination values vary within the range of .37-.74. The highest score to get on the Narrative-2 test is 10.

Table 6: Item and Test Statistics of the Narrative Text-2

Question No	Difficulty Index	qj=1-pj	Variance	Standard Deviation	Discrimination Coefficient	Reliability
1.	.69	.31	.21	.46	.37	.17
2.	.78	.22	.17	.41	.57	.23
3.	.67	.33	.22	.47	.71	.33
4.	.46	.54	.24	.50	.37	.18
5.	.81	.19	.15	.39	.42	.16
6.	.74	.26	.19	.44	.51	.22
7.	.58	.42	.24	.49	.54	.26
8.	.72	.28	.20	.45	.54	.24
9.	.63	.37	.23	.48	.74	.36
10.	.70	.30	.21	.46	.37	.17

Standard Deviation of the Test (S): 2.50, Difficulty of the Test (P): .67, Reliability of the Test (KR-20): .72

Many different statistical formulas have been developed to compute the internal consistency using the item statistics. The most widely used ones among these formulas are Kuder-Richardson 20 and 21 (Karasar, 2017). The Kuder-Richardson 20 (KR-20) formula is used in the studies in which the answers in the test are coded as correct/wrong (Büyüköztürk, 2014).

In this study, the reliability of the achievement tests was computed using the Kuder-Richardson (KR-20) formula. The KR-20 reliability coefficients of RCTIT-1 (Reading Comprehension Test for Informative Texts), RCTIT-2, RCTNT-1 (Reading Comprehension Test for Narrative Texts), and RCTNT-2 were found to be .70, .70, .71, and .72, respectively. According to Büyüköztürk (2016), a KR-20 reliability coefficient equal or higher than .70 is considered as adequate for the reliability of the test scores.

5. Discussion and Conclusion

In this study, it was attempted to develop a measurement tool to measure the reading comprehension skills of the 7th graders and two types of reading comprehension tests, that is, informative and narrative tests, were created. Based on the literature review, the draft test items were prepared and presented to the experts to receive their opinions. As a result of the feedback given by the experts and the item analysis carried out based on the finding obtained from the draft achievement test, the reading comprehension tests for informative texts-1/12 questions, informative texts-2/14 questions, narrative texts-1/10 questions, and narrative texts-2/10 questions were created. The test difficulty was also computed using the discrimination and difficulty values of the test items. For the items in the test, the correct answers were coded as "1" and the wrong answers were coded as "0", and the data obtained from these answers were analyzed using the package program. The highest scores a student can get on the Informative-1, Informative-2, Narrative-1, and Narrative-2 test were determined as 12, 14, 10, and 10, respectively. This scoring system should be taken into account when the reading comprehension levels of the students are being evaluated.

The test items created in different styles have been used in evaluating the reading comprehension level of students (G neŐ, 2012). In this study, the items in the reading comprehension test were prepared as multiple-choice. When the studies on preparing reading comprehension test in the literature were examined, it was observed that the multiple-choice test items were used in the test preparation process (Yaman & DađtaŐ 2013; Yıldız & Akyol, 2011); in some studies, in order to determine the reading comprehension level, open-ended questions were asked to the students and they structured the answers ( elik, Demirg neŐ & Fidan, 2015); and in some other studies, the multiple-choice tests and open-ended exams were compared to determine their effect on the reading comprehension skills of students (Temizkan & SallabaŐ, 2011). Fill in the blank questions were also used to determine the reading comprehension level of students (Dađ, 2010; Kızılaslan & Tun er, 2015). In this study, a reading comprehension test was developed to determine the reading comprehension skills of the students. It is thought that the future researchers can use this study in their studies to be carried out to determine the reading comprehension level of students in informative and narrative texts.

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