Education and Science

Vol 45 (2020) No 203 177-190

The Relationship Between Inference Skills and Reading Comprehension *

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Abstract

This research aims to reveal the extent to which inference-making ability predicts reading comprehension skill. The research participants consisted of 117 middle-grade students attending 5th and 6th grades. The data was collected by Inference-Making Ability Test and Reading Comprehension Test. The tests were administered to the respondents in a single session and the answers were interpreted by two evaluators. The answers provided by the participants were imported into a statistical software after being coded and were analyzed. The research findings showed that the participants had poor level of inference-making ability. Whereas reading comprehension skills of the participants was at a medium level. While especially lexical inferencing was achieved at a satisfying level, propositional and pragmatic inferencing could not be attained at sufficient levels. The research results assert that inference-making ability predicted reading comprehension skill at a medium level. In light of this finding, it was recommended to introduce and include inference-making strategy in reading and literacy education so that the level of reading comprehension skill would be enhancedges.

Keywords

Inference

Reading

Comprehension

Text

Article Info

Received: 05.28.2019

Accepted: 11.20.2019

Online Published: 05.13.2020

DOI: 10.15390/EB.2020.8782

Introduction

Reading is a process of constructing meaning through a written text. In the construction of meaning, both mechanical and cognitive processes are linked and go hand in hand with one another. The mechanical dimension comprises processes such as visually processing the words, identifying their phonological, orthographic and semantic representations and connecting the words by using rules of syntax (Perfetti & Stafura, 2014). Whereas the cognitive process covers the activation of the necessary background knowledge, identification of text structure, making sense of the author's purpose and inference generation (Graesser, 2015). These processes are mandatory in reading.

Among the processes cited in the cognitive dimension of reading is inference-making. Inference is made for accessing the information that is implicit in the text. Access to implicit information is ensured by interpreting the information that is explicitly expressed in words. Interpreting process enables the reader to use his/her prior knowledge related to the content for constructing the meaning. Inference-making that is aimed at sustaining one's comprehension across the text means either referring to the prior knowledge or generation of the information during reading that is not originally provided in the

* This article is orally presented at the congress on XI. International Conference on Turkish Education and Teaching.

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text (Elbro & Buch-Iversen, 2013). Generation of information missing in the text comes from the necessity to construct coherent meaning in the text.

Construction of meaning constitutes the fundamental component of reading (Carlisle, Kelcey, Berebitsky, & Phelps, 2011). Reading is a task of constructing meaning whereby mechanical and cognitive operations are processed through the use of the data provided in the text. In this sense, comprehension is referred to as an integrated performance that is based on experiential background, reason for reading and the context provided (Rasinski, Padak, & Fawcett, 2010). Whereas inference is a cognitive operation conducted to ensure the coherency of the meaning produced across the text (Elbro & Buch-Iversen, 2013). The ground for making inference is the inability to acquire the integrated meaning of the text solely through the linguistic knowledge. Hence, the content provided by the linguistic knowledge itself is integrated to the meaning drawn by inference-making between the lines in the process of meaning construction.

Reading skill starts to develop with decoding and word fluency and evolves in time to inference-making ability. Inferences serve as mediators for ensuring deep comprehension of the text. As a matter of fact, in order to understand the text, the reader must associate the information obtained across the text with the background information or must fill in details missing from the text that ruptures its coherency (Cain, Oakhill, Barnes, & Bryant, 2001; van den Broek, 1997). The lengthy and complex texts in particular urge the reader to make inferences for a qualified reading. Therefore, it is a must that the reader has sufficient level of background knowledge on the words and concepts given in the text and is able to integrate the information from earlier parts of the text to the later information (Kendeou, van den Broek, Helder, & Karlsson, 2014; Kispal, 2008). These operations which constitute the components of meaning construction are carried out in coherence to the text structure. The text starts to generate meaning in this way.

Although inference-making is performed for the acquisition of implicit information hidden in the overall textual information, it is also functional in apprehending the explicit information in the text. When the explicit information is used for accessing the implicit information, it takes up a different role than solely conveying its own denotation in the reader's mind. That is why inference not only constructs the mental model of the text but it also strengthens memory in the process of understanding explicit information (Gernsbacher, 1990; Kintsch, 1998; Perfetti, 1999). So, one could conclude that inferences are beyond simply just filling the gaps in reading comprehension.

Reading process usually requires two types of inference-making. One of them is local references which usually involve making inferences between and across clauses, and the other is global inferences which are drawn across the whole text (Graesser, Singer, & Trabasso, 1994; Gygax, Garnham, & Oakhill, 2004). It is possible to say that drawing local inferences are relatively easier than drawing global inferences. This is because the more the distance is between the pieces of information the harder to draw inferences (Johnston, Barnes, & Desrochers, 2008). Therefore, the reader's individual qualities play a role in ensuring successful inference-making. Hence, due to its mentioned properties, inference-making ability affects reading achievement.

Information that are drawn from inference-making and that are implicit in between the lines of a text might be of different nature. The implicit information in the text is usually related to (1) ambiguous words, (2) pronominal referents, (3) identification of context for sentences, (4) establishment of framework for interpretation, (5) causes and consequences of events and (6) recognition of incongruent events (Trabasso, 1981; Nicholas & Trabasso, 1980). These aspects are sometimes not expressed clearly in the text but still serve for generating coherent meaning by making the reader sense their presence within the text.

There exist different approaches towards inference taxonomy in the literature. Each of these specifies inference categories according to a different criterion. In one of the main categorizations made for inference categories, the relation to the text is taken as basis. Text-connecting inferences require the reader to find logical connections between propositions or events expressed in a text; however, slot or gap filling inferences require filling in missing details in the text by using world knowledge. Thus, it

could be asserted that inferences can be addressed as text-based and non-text based inferences (Chikalanga, 1992).

Another distinction drawn between inferences is the ones called propositional and pragmatic inferences (Chikalanga, 1992). Propositional inferences are considered necessarily true because they are obtained from the semantic structure of the explicitly given content in the text. However, pragmatic inferences are regarded plausible inferences since they are generated based on the world knowledge of the reader rather than linguistic input. Graesser (1981) asserts that these inferences are generated via two sources. One of them is a set of schemata that a reader uses during reading, while the other is a set of conversational rules shared by the author and the reader. Thus, these sets of schemata and conversational rules are knowledge sources beyond the linguistic input of a text.

Three kinds of responses were revealed as a result of the distinctions made on inference. According to Pearson and Johnson (1978), there are three types of inferences in the context of questions-answer. If a response is available right there in the text, it is classified as textually explicit; if both the question and the answer are present in the text, it is classified as textually implicit; and finally, if the question is derived from the text but the response is not, then it is classified as scriptally implicit. In the latter, the response is in the reader's long-term memory. Chikalanga (1992) states that the first one of these inferences is actually related to the simple understanding of the text and thus there are in fact only two categories in this taxonomy.

The second taxonomy was made by Warren, Nicholas, and Trabasso (1979). Three types of inference-making are addressed in this taxonomy as well. Logical inferences are made in response to the questions why? and how? and focus on the relations between the events. There are three subtypes under logical inferences: motivational, causative and enablement inferences. Informational inferences are used for identifying people, objects, times, places and context of events and these inferences are made in response to the questions who? what? and when?. Under informational inferences, there are subtypes that can be classified as pronominal, referential, spatio-temporal and elaborative. The third category of inferences is evaluative inferences. These inferences, which are prone to be affected by the reader's knowledge and beliefs, assess the significance, normality, morality and validity of events.

Third distinction on inference taxonomy was made by Nicholas and Trabasso (1980). This taxonomy involves lexical, spatio-temporal, extrapolative and evaluative inferences. These show similar qualities to the categories cited in the former taxonomy. The difference is in their naming.

Chikalanga (1992) made another categorization by taking into account inference categories outlined above. In this approach, which is in fact a summary of previous inferences, Chikalanga suggests three categories of inferences: lexical, propositional and pragmatic inferences. Lexical inferences are used to acquire the meanings of certain pronominals and ambiguous words through contextual clues. The second category is propositional inferences. These are actually logical inferences that are drawn based on the semantic context of the text. Under this category lie two inference categories: 'logical informational' inferences and 'logical explanatory' inferences. Logical informational inferences are for obtaining referential or spatio-temporal information and provide details about specific people, places, objects and context and are thus made in response to the questions who? what? where? and when? Logical explanatory inferences, on the other hand, are for obtaining motivational, causative and enablement related information and are thus made in response to questions why? and how? Pragmatic inferences consist of three subtypes as well. These are 'elaborative' informational inferences (1) which comprise referential or spatio-temporal; and 'elaborative' explanatory inferences (2) which comprise motivational, causative or enablement inferences and evaluative inferences (3). Pragmatic inferences require sources other than the information stated in the text. This source is found in the long-term memory of the reader.

The categorization suggested by Chikalanga (1992) is as follows:

Table 1. Suggested Taxonomy

Basic Category	Specific Types	Question-Answer Relationship
1. Lexical	a. Pronominal Inferences b. Ambiguous/ unfamiliar word meanings	Textually / scriptally implicit
2. Propositional	a. Logical Informational - referential - spatio-temporal b. Logical Explanatory - motivational - causative - enablement	Textually implicit
3. Pragmatic/ Scriptal	a. Elaborative Informational - referential - spatio-temporal b. Elaborative Explanatory - motivational - causative - enablement c. Evaluative	Scriptally implicit

Adopted from Chikalanga (1992)

The inferences outlined above can be considered an important component of reading comprehension process. Global meaning can be acquired by the reader if inferences, which are one of the effective ways of accessing the information embedded in the text, are drawn correctly and in line with the context. It is a known fact that individuals who are not adequately good at reading comprehension experience difficulties when it comes to inference-making (Cain & Oakhill, 1999; Bishop & Adams, 1992). Based on this, one could assert that students who are good at making inferences can also be good comprehenders.

Inferences are not mere operations carried out in written texts. It is known that children engage in inference-making processes when looking at picture stories, when listening to stories, or during television viewing and in other areas of life (Kendeou, Bohn-Gettler, White, & van den Broek, 2008). No matter how the content is being made available, reader or viewer should make inferences as a requirement of one's comprehension skill (Gernsbacher, Varner, & Faust, 1990). Albeit referred to in many areas being the part of cognitive processes, one of the major areas where inferences are actually used is reading. Among the reasons for this is that texts, which serve as signification tool, are primarily constructed based on inferences. This is why inferences are believed to be the key component of reading (Garnham & Oakhill, 1996; Graesser et al., 1994; Singer, 1994; van den Broek, 1994). Furthermore, although less skilled readers are capable of inferential processing, they do not generate inferences as good as more skilled readers do (Casteel, 1993; Casteel & Simpson, 1991; Long, Oppy, & Seely, 1997) which is another evidence proving this assertation. Therefore, inferences are prerequisite to better comprehension both in reading and areas outside reading.

Some of the researches conducted in the field of reading in Turkey show us that there is a correlation between reading comprehension and inference. For example, in the study performed by Kudret and Baydık (2016), it was detected that readers who are poor at comprehension did not perform well in answering various questions and had difficulties in finding the key message in the text. This finding is not surprising at all, given the fact that key message in texts can be acquired with the help of making inferences of what is read. In another study carried out by Baydık (2011), it was found that students who had difficulty in reading had also difficulty in making a cause-effect relationship and drawing inferences. Moreover, in a study by Uzun, Bozkurt, and Erdoğan (2011), it was determined that primary school students performed relatively poor in making scriptally lexical inferences when compared to other dimensions of text comprehension. It can be argued that these studies implicate, to

a certain degree, the relationship between reading achievement and inference-making ability of students who read Turkish texts. As no studies were found that directly center upon the relationship between reading comprehension in Turkish and inferences, this research aimed at filling this gap. To this end, answers to the below questions were sought:

1. What is the situation of participations in terms of inference-making ability and reading comprehension skill?
2. How does inference-making ability predict reading comprehension skill?
3. Do inference-making ability and reading comprehension skill of the participants differ by their gender?
4. Do inference-making ability and reading comprehension skill of the participants differ by their grade?

Method

This research is a quantitative research conducted based on relational model. Researches that are conducted based on relational model focus on detecting whether there is a relation between two variables (Büyüköztürk, Kılıç Çakmak, Akgün, Karadeniz, & Demirel, 2017). In this study, relation between inference-making ability and reading comprehension skill, which constitute the two main variables of this research, was investigated.

Participants

The participants of the study consisted of 115 middle school students (45 fifth grade and 70 sixth grade). As a comparison was made in terms of gender and class variable, stratified purposive sampling was applied. Of the participants who were attending fifth and sixth grades at the time of the research at a secondary school in the province of Malatya, 42 were female and 73 were male students. The reason for having selected the participants from fifth and sixth grades was that this is the age period when the number of inferences drawn noticeably increases and students encounter texts that entail them to make inferences (Oakhill, 1984; Currie & Cain, 2015). It is known that middle-grade students struggle even with local inferences in some of the texts they frequently come across in this stage of their lives (Barth, Barnes, Francis, Vaughn, & York, 2015).

Data Collection Tools

The data of the research were collected with two different tools. One of them is Inference Ability Test. The inference test developed by the researchers comprised 13 open-ended questions. Test was prepared based on a story, Sinağrit Baba (Abasıyanık, 2016), that was identified to have been in line with the middle-grade students' level according to the expert opinions. To this end, initially the implicit information in the story were identified and categorized. Chikalanga's (1992) taxonomy was taken as a basis in the determination of inferences. Implicit information at lexical, propositional and pragmatic level in the story were reflected as open-ended questions. Considering the role that inferences play on thinking processes, it was deemed appropriate that the test would consist of open-ended questions.

Lawshe's method was utilized for the validity and reliability of the test. Lawshe is a method that is referred to when statistical processes cannot be applied and is rather used for developing qualitative tools (Yurdugül, 2005). In this method, the central component of which is the expert opinions, between 5 and 40 experts' opinions are consulted for the scale to be developed. The content validity rates of the answers are measured in terms of the relevancy of the items to be used. Thus, the qualitative answers can be turned into quantitative values. Inference Ability Test used in this study was developed this way. In this scope, five experts' opinions were received on the items prepared. The items for which the experts gave negative opinions were excluded from the test, while only the agreed items were used. Therefore, the content validity of the test is fully valid.

The second data collection tool used in the research was Reading Comprehension Test. The test comprised 28 items that were grouped as open-ended questions, multiple choice questions, filling-in-the-blanks questions and true-false questions. The reliability coefficient of the test which was developed

based on the middle-grade students (Cronbach's Alpha) was determined to be .744 and (Sperman Brown) .802, respectively. Furthermore, the test's average item strength was estimated to be .507 and average differential item was estimated to be .431 (Ülper, Çetinkaya, & Bayat, 2017). In light of these values, it could be asserted that the test is applicable. Nine out of all the items in reading comprehension test is related to inferences, eight of them is related to relations between propositions, three of them is related to key messages, eight of them is related to surface text and two of them is related to the title. Hence this test has a nature that measures reading comprehension skill not only from inference aspect, but also from all aspects.

Data Collection and Analysis

In the data collection process, the participants were initially administered reading comprehension test. Inference Ability Test was applied 3 days after reading comprehension test. Both of them were applied in one session and the answers given were analyzed by two evaluators. The results of reading comprehension test were determined by an answer key, whereas the results of inference ability test were scored by the evaluators' comments. The agreement between the evaluators was hundred percent in the inference test. The answers given to the items in the test were coded and transferred to the spss 22 statistical software.

Various preliminary studies were conducted in order the identify the possible statistical techniques to be used in the analysis of the data. For this, the lost and extreme values were examined firstly. No loss values were identified in the data set; however, the participants who had been found to constitute extreme values (subjects no. 113 and 130) were excluded from the data set. Thus, the number of participants in the research decreased to 115 after having excluded the subjects of extreme values. The total scores obtained by the participants were calculated with the aim to determine their situation in inference ability and reading comprehension skill as well as their situation in the sub-dimensions of these skills. To ensure the post-comparability, total scores in each dimension were divided by the relevant number of questions, the average scores were then determined and descriptive statistical calculations were carried out based on these average scores. Simple linear regression analysis was conducted so that the extent to which the participants' inference abilities predicted their reading comprehension performance would be determined. The normality in the distributions of the scores obtained by the participants in the sub-groups created according to the gender and grade variables was investigated in order to reveal whether the participants scores in inference ability, reading comprehension skill and in the sub-dimensions of these skills differed by gender and grade variables. The normality tests according to gender are presented in Table 2 and the normality tests according to grade are presented in Table 3.

Tablo 2. Normality Test Results by Gender

	Gender	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Reading Comprehension	1,00				,949	42	,059
	2,00	,140	73	,001			
Inference-making	1,00				,913	42	,004
	2,00	,155	73	,000			
Reading Comprehension (deep structure)	1,00				,934	42	,017
	2,00	,131	73	,003			
Reading Comprehension (surface structure)	1,00				,936	42	,021
	2,00	,154	73	,000			
Lexical Inferences	1,00				,756	42	,000
	2,00	,268	73	,000			
Propositional Inferences	1,00				,852	42	,000
	2,00	,217	73	,000			
Pragmatic Inferences	1,00				,852	42	,000
	2,00	,316	73	,000			

Tablo 3. Normality Test Results According to Grade

	Grade	Kolmogorov-Smirnova			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Reading Comprehension	5,00				,935	45	,015
	6,00	,166	70	,000			
Inference-making	5,00				,948	45	,043
	6,00	,230	70	,000			
Reading Comprehension (deep structure)	5,00				,934	45	,013
	6,00	,116	70	,021			
Reading Comprehension (surface structure)	5,00				,951	45	,058
	6,00	,164	70	,000			
Lexical Inferences	5,00				,781	45	,000
	6,00	,282	70	,000			
Propositional Inferences	5,00				,880	45	,000
	6,00	,265	70	,000			
Pragmatic Inferences	5,00				,844	45	,000
	6,00	,278	70	,000			

As it had been discovered that the distributions in some of the sub-groups were not normal, Mann Whitney U test, i.e. one of the non-parametric tests, was used.

Results

Below is Table 4 presenting the descriptive statistics on the situation in inference ability, reading comprehension skill as well as the situation in the sub-dimensions of these skills.

Table 4. Situation in Inference Ability and Reading Comprehension Skill

	Reading Comprehension (28)	Inference-making (13)	Reading Comprehension (deep structure 15)	Reading Comprehension (surface structure 13)	Inference-making (Lexical 2)	Inference-making (Propositional 5)	Inference-making (Pragmatic 6)
N	115	115	115	115	115	115	115
Average	,604	,237	,579	,633	,448	,240	,164
Std. Deviation	,157	,181	,149	,213	,327	,227	,204
Minimum	,18	,00	,20	,08	,00	,00	,00
Maximum	,88	,77	,87	1,00	1,00	,80	,83

When Table 1 is reviewed, it is seen that the participants' average scores in inference ability and the sub-dimensions of this ability in the 0-1 range is at a low rate. Whereas it is observed that their average scores in reading comprehension skill and the sub-dimensions of this skill in 0-1 range is at a medium level.

Following Table 5 and Table 6 show the results of simple linear regression analysis which was conducted so that the extent to which the participants' inference abilities predicted their reading comprehension skill would be revealed.

Table 5. Model Summary and ANOVA Results

	Sum of Squares	sd.	R	R^2	F	p
Regression	407,915	1	,430	,185	25,608	,000
Residue	1800,033	113				
Total	2207,048	114				

The correlation between reading comprehension and inference-making was calculated as 0.430. This correlation is at a medium level. Inference-making abilities of the participant individuals explain 18.5% of the variable related to reading comprehension skills. The analysis results show that the model established for the prediction of participants' inference-making abilities by their reading comprehension skills is significant, $F(1, 113)=25.608$, $p<0.05$.

Table 6. Regression Model

Variable	Coefficient	Std. Error	β	t	p
Stable	14,432	,614		23,497	,000
Reading Comprehension	,803	,159	,430	5,060	,000

According to the results of the t test applied on the significance level of the regression coefficient presented in Table 6, the participants' inference abilities are a meaningful predictor on their reading comprehension skills. The regression equality on the prediction of reading comprehension according to the analysis results are as follows:

Reading comprehension = 14.432 + 0.803 inference

When the model is examined, it can be seen that 1 unit of increase in inference-making ability causes 0.803 unit of increase in reading comprehension skill.

Table 7 shows the results of Mann Whitney U test conducted in order to reveal whether the participants' scores in inference ability, reading comprehension skill and in the sub-dimensions of these skills differed by gender. In the table, female participants were coded as 1 and male participants were coded as 2.

Table 7. Differences by Gender

	Gender	N	Mean rank	Sum of the ranks	U	p
Reading Comprehension	1,00	42	64,43	2706,00	1263,000	,116
	2,00	73	54,30	3964,00		
	Total	115				
Inference-making	1,00	42	64,94	2727,50	1241,500	,087
	2,00	73	54,01	3942,50		
	Total	115				
Reading Comprehension (deep structure)	1,00	42	68,89	2893,50	1075,500	,007
	2,00	73	51,73	3776,50		
	Total	115				
Reading Comprehension (surface structure)	1,00	42	59,31	2491,00	1478,000	,747
	2,00	73	57,25	4179,00		
	Total	115				
Lexical Inferences	1,00	42	57,57	2418,00	1515,000	,907
	2,00	73	58,25	4252,00		
	Total	115				
Propositional Inferences	1,00	42	62,18	2611,50	1357,500	,287
	2,00	73	55,60	4058,50		
	Total	115				
Pragmatic Inferences	1,00	42	68,49	2876,50	1092,500	,006
	2,00	73	51,97	3793,50		
	Total	115				

The above Table 7 reveals that the scores obtained in inference-making (U=1241,500, p>0.05), reading comprehension (U=1263,000, p>0.05), surface structure comprehension (U=1478,000, p>0.05) and lexical (U=1515,000, p>0.05) and propositional inference (U=1357,500, p>0.05) do not show significant difference by gender.

It is seen from the same table that the scores obtained by the participants in deep structure comprehension (U=1075,500, p<0.05) and pragmatic inference (U=1092,500, p<0.05) do differ significantly by gender. The female participants' scores in deep structure comprehension and in pragmatic inference are statistically higher than those of the male participants.

Table 8 shows the results of Mann Whitney U test conducted in order to reveal whether the participants' scores in inference ability, reading comprehension skills and in the sub-dimensions of these skills differed by grade.

Table 8. Differences by Grades

	Grade	N	Mean rank	Sum of the ranks	U	p
Reading Comprehension	5,00	45	68,07	3063,00	1122,000	,009
	6,00	70	51,53	3607,00		
	Total	115				
Inference-making	5,00	45	64,67	2910,00	1275,000	,082
	6,00	70	53,71	3760,00		
	Total	115				
Reading Comprehension (deep structure)	5,00	45	62,44	2810,00	1375,000	,247
	6,00	70	55,14	3860,00		
	Total	115				
Reading Comprehension (surface structure)	5,00	45	70,32	3164,50	1020,500	,001
	6,00	70	50,08	3505,50		
	Total	115				
Lexical Inferences	5,00	45	58,80	2646,00	1539,000	,817
	6,00	70	57,49	4024,00		
	Total	115				
Propositional Inferences	5,00	45	63,68	2865,50	1319,500	,126
	6,00	70	54,35	3804,50		
	Total	115				
Pragmatic Inferences	5,00	45	64,34	2895,50	1289,500	,080
	6,00	70	53,92	3774,50		
	Total	115				

Table 8 reveals that the scores obtained in inference-making (U=1275,000, p>0.05), deep structure comprehension (U=1375,000, p>0.05) and lexical (U=1539,000, p>0.05), propositional (U=1319,500, p>0.05) and pragmatic inference (U=1289,500, p>0.05) do not show significant difference by age. It is seen however that the scores obtained by the participants in reading comprehension (U=1122,000, p<0.05) and surface structure comprehension (U=1020,500, p<0.05) do differ significantly by grade level. The 5th grade participants' scores in reading comprehension and in surface structure comprehension as well as in pragmatic inference are statistically significantly higher than those of the 6th grade participants.

Conclusion and Discussion

One of the results of this study, which focuses on inference-making ability and reading comprehension skill, addresses the average success rates of the participants. Reading comprehension achievement of the participants was discovered to be at a medium level. This result was derived from the sum of the questions on the deep and surface structure included in the reading test. When it is considered that the participants answered almost equally the questions on deep and surface structures, it can be argued that reading comprehension skill is not particularly acquired from a single aspect, but from all dimensions of reading comprehension. Therefore, it might be expected that the success rate of the participants in the inferences drawn from the deep structures of the text would be at a medium level. This hypothesis is also grounded upon the fact that Reading Comprehension Text included inferential questions. However, the average of the scores gained by the participants was at a low level. The average success rates in inference-making which was determined as .237 in the 0-1 range comprises the sum of lexical, propositional and pragmatic inferences. The ones in which the participants performed the highest is respectively as follows: lexical (.448), propositional (.240) and pragmatic (.64) inferences. To state it more clearly, the participants performed relatively good at lexical inferences which are believed to be the easiest amongst inference categories, while their success in making propositional and pragmatic inferences decreased, as these two are thought to be harder. In brief, it can be said that the participants were unsuccessful in inference-making.

The results obtained regarding inference-making are consistent with those of other researches. The participants included in the research conducted by Uzun et al. (2011) were less likely to perform well at scriptally inferences as compared to the other dimensions of reading. Given that scriptally inferences correspond to pragmatic inferences, it can be concluded that the result obtained by Uzun and others does overlap with the result of this research. This overlapping is also present in the study carried out by Baydık. In Baydık's study, the participants were not able to perform adequately in inference-making. Considering that individuals who are insufficient in reading and linguistic semantics have more difficulty in inference-making (Cain & Oakhill, 1999; Bishop & Adams, 1992), it would be safe to say that the participants could not give reactions to the text in terms of reading comprehension strategies.

Another finding revealed by the research was the relation between inference-making and reading comprehension. A medium-level relation was detected between inference-making and reading comprehension achievement. In another words, inference is a meaningful predictor of reading comprehension. One unit of increase in inference-making influences success in reading comprehension at the rate of 0,803. This relation can also be considered vice versa. The rate of prediction demonstrates the correlation level between inference-making ability and reading comprehension performance in the scale of participants.

Inference-making and reading comprehension relation is a point emphasized across numerous researches. Cain, Oakhill, and Bryant (2004) state that inference-making and comprehension monitoring play a key role in the success of the reader. For a successful comprehension the reader is supposed to integrate the pieces of information acquired from the text with each other and into other information in his/her memory. The reader should especially make sure to do so, when the linguistic processing does not produce a coherent semantic structure. Monitoring refers to checking whether there is a disruption (*rupture*) in comprehension and in case there is, then the reader must apply a strategy to repair it. Inference is one of such strategies. The contribution made by inference to comprehension varies by linguistic level of the semantic structure of the text and the distribution of this structure across the text. These two points, which can be considered the sources of the textual comprehension, construct a mandatory relation between reading comprehension and inference-making.

Different inferences should be used for different dimensions so that the reader can understand the text. Text based inferences contribute to comprehending the internal text structure. It is stated that such inferences are necessary for comprehension but are not enough for it (Kendeou, Papadopoulos, & Spanoudis, 2012). Text based inferences construct the lowest level of coherency in the mental model of the text (McNamara & Magliano, 2009). This phase is preliminary in the text comprehension. Whereas the informational inferences are built on the background knowledge of the reader and it is a type of inference that is harder to draw. The gaps in the text are filled with the informational inferences. The reader codes the informational inferences within the mental representation of the text (Graesser et al., 1994; McNamara & Magliano, 2009). Such inferences help explore the conversational dimensions of the text. The participants of this study were able to perform successfully mostly in lexical inferences that can be grouped under text-based inferences. The success rate was low in propositional and particularly in pragmatic inferences. More normal distribution related to inference categories could reflect the relation between inference-making and reading comprehension performance better.

The other result yielded by the research was about gender. No meaningful differences were detected between the successes shown by female and male participants in terms of general success in reading comprehension and success in surface structure sub-dimension of reading comprehension and lexical and propositional sub-dimensions of inference-making. However, it was seen that female participants were able to perform better at deep structure dimension of reading comprehension and pragmatic dimension of inference-making. In other words, female participants performed better in points requiring more knowledge and skills in both reading and inference-making. This result is also consistent with the relevant literature because there is a great number of researches that show that girls are more successful in language studies (Topuzkanamış & Maltepe, 2010; Çiftçi & Temizyürek, 2008; Güngör, 2005; Altunkaya, 2018). The dimensions where no differences were found by gender were the points in which reading comprehension was relatively easier. The reason why no differences were found could be that since these points were easy for the participants, they all demonstrated good performance.

When the results on the grade level were examined, no significant differences were found between 5th and 6th grades in overall inference-making and all its sub-dimensions as well as in deep structure sub-dimension of reading comprehension. Nevertheless, it was discovered that 5th graders were more successful than 6th graders in the entirety of reading comprehension and its surface structure sub-dimension. As for the result of not finding any differences in inference-making dimension by grade could be explained by the fact that the overall performance of the participants in inferential processing was not adequate. Especially in informational inferences, individuals who are younger and are not well-read make poorer or lesser inferences as compared to those who are older and are well-read (Barnes, Dennis, & Haefele-Kalvaitis, 1996; Cain et al., 2001). Students are not expected to acquire their inference skills spontaneously in the process and to work them off competently in the reading process. The results of the studies in the literature suggest that a programmatic instruction towards inference strategies significantly increases students' skills (Andreassen & Braten, 2011; Graesser, Wiemer-Hastings, & Wiemer-Hasting, 2011; Oakley, 2018). With the help of a program prepared, knowledge-based and text-based inference strategies should be gained to students with different narrative text types in terms of difficulty, length and implicit knowledge.

Based on the results of the research, it is recommended to focus particularly on inference-making in reading and literacy education. As textual comprehension entails both the identification of internal relations in the text and the incorporation of external knowledge that serve as a source- into the text, a syllabus that would involve the topic of inference-making could result in a better comprehension performance. It is recommended to use fictional texts that are more suitable for inference in educational settings. However, investigations can also be made about inferences in informative texts. Finally, the inference skills that are questioned on the basis of a particular text in this research should be questioned through inferences in independent expressions through different studies. Such research will provide clearer data on the level of students' inference skills.

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