EVALUATION OF TURKISH HEARING IMPAIRED STUDENTS' READING COMPREHENSION WITH THE MISCUE ANALYSIS INVENTORY

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The purpose of the current study is to evaluate the reading comprehension of hearing impaired 8th graders who are being trained through an auditory-oral approach. The evaluation is conducted through miscue analysis using complex stories. To realize this aim, the following research questions are formulated. (1) To what extent do hearing impaired K-8 students use the language cue systems (i.e. syntax, semantics and graphophnonics) during reading. (2) What is their reading comprehension level? (3) Is there a consistency between the mistakes they make and their reading comprehension levels?
Ten severe to profoundly hearing impaired secondary students who are at the Research and Education Center for Children with Hearing Impairment (i.e. İÇEM) at Anadolu University participated in the current descriptive study. Since there is not any ready reading inventory in Turkey, stories with different levels along with retelling, question-answer and fill-in-the-blanks forms regarding those stories were prepared. Results suggest that when hearing impaired students read a story at their instructional level, they do use their knowledge of syntax, semantics and graphophnonics, they understand what they read and there is a consistency between the mistakes they make and their reading comprehension.

In reading education, the expertise of teachers of the reading process is as important as students' background knowledge and proficiency in reading. Readers comprehend what they read using their background knowledge and reading skills. They need to decipher and understand the written materials using these skills and knowledge. It is necessary for teachers to evaluate the texts that are deciphered and comprehended by the readers so that they can develop students' insufficient strategies in reading comprehension.

Reading can be defined in several ways. Among those definitions, different aspects of reading are listed such as speaking out all words given on a page or interacting with the text to construct meaning. Reading comprehension is the process of combining the cue systems of the language, namely, syntax, semantics, pragmatics and graphophnonics with the prior knowledge and experiences. If readers have a purpose to read and if the material interests them, they involve their background knowledge in the process, too, which facilitates reading comprehension. Previous research particularly emphasizes that reading comprehension is an active and interactive process between the readers and the written materials in which readers attribute meanings to the text through their background knowledge (Goodman, 1995; Lewis & Wray, 2000; Rasinski & Padak, 2004; Zwiers, 2004).

Goodman, Watson and Burke (1987), define reading as the process of problem solving and meaning construction. Readers construct meaning while they are thinking about what the author tries to tell. During this construction, they use their language, their thoughts and their background knowledge. In order to develop the crucial elements of reading comprehension,

namely decoding and understanding, reading strategies should be taught in a specific sequence and these strategies should later be combined so that the comprehension process is realized. Within time, the notion of literacy has changed, that is, simultaneous development of reading strategies and the gains readers get through interacting with the texts are given more importance. In order to get a clearer picture of this new literacy concept in both general and special education, which focuses not only decoding the text but also comprehending it, the necessity to revise the education and evaluation in classes arose (Chaleff & Ritler, 2001; Ewoldt, 1981; Schirmer, 2000).

In teaching and developing reading, it is important to evaluate every single student constantly in order to assist them during their meaning construction process more effectively (Miller, 2001). This application has an additional importance for teachers working with hearing impaired children because of the difference in the language development process of the hearing impaired students, hearing loss and poor academic achievement they demonstrate (Paul, 1998).

Research revealed that hearing impaired children's knowledge of language is not same as their hearing peers. Thus, students who have serious hearing problems or who have impaired hearing at the pre-acquisition stage of language confront with problems while they are learning to read (Girgin, 1999; Paul, 1997; Quigley & Paul, 1985). However, previous research revealed that hearing impaired children employ the same reading skills and strategies as their hearing peers (Moog & Geers, 1985; Schirmer, 2000). In reading evaluation, miscue analysis is used to evaluate students' oral reading mistakes. Using miscue analysis plays a crucial role in determining and developing reading strategies regarding reading comprehension. Informal reading inventories which contain different levels of texts are used in order to conduct the miscue analysis.

Miscue Analysis

In the United States, Kenneth Goodman, Yetta M. Goodman and Carolyn Burke investigated children's first years of literacy in the 1970s and developed the miscue analysis for reading evaluation. In miscue analysis, the idea is to observe children interacting with the text and evaluate what they do (Goodman et al., 1987; Goodman, 1995).

Miscue is the word read differently from its original from during oral reading including reading words that are not in the text, not reading words that are in the text, skipping words, replacing the words in the text with other words. It is emphasized that miscues done during oral reading are done during silent reading as well (Goodman, 1995). No matter how proficient they are, all readers can make mistakes. There are two basic principles in miscue analysis. First, all readers make mistakes and these differences in reading are not always *wrong*. Second, miscues give us information about readers' prior knowledge, past experiences, undertakings to construct meaning from the text and active reading strategies they use (Davenport, 2002; Rasinski, 2003).

Miscues made during oral reading give important information about readers' thinking and use of the language's cue systems. These systems help readers understand how reading is realized and control the meaning construction process through asking questions while reading (Goodman, 1995). The cue systems of the language employed by readers are explained below.
*Syntax***:** is a system regarding the structure of the language and involves the grammatical rules along with the information about sequencing words in order to construct meaningful sentences. When readers read a sentence, they think whether that sentence carries the characteristics of a sentence concordant with the rules peculiar to the language (Davenport, 2002; Goodman et al., 1987).

*Semantics***:** is the meaning system of the language and provides information about the meanings of words, phrases and sentences along with the ways those meanings can change in

different situations. When readers read a sentence, they think whether the sentence carry a meaning (Davenport, 2002; Goodman et al., 1987).

Pragmatics: This system involves the language which is accepted and expected in specific situations, or the language that should be used in line with the social rules. When readers read a sentence, they think about what to say in that specific situation or environment (Davenport, 2002; Goodman et al., 1987)

Graphophnonics: This system involves information about the relationship between the letters, sounds of those letters and the form of the letter sequences in words. Readers think how letters and sounds of letters help in choosing the meaningful word to construct a meaningful speech unit. (Davenport, 2002; Goodman et al., 1987)

It is necessary and crucial that readers focus on the meaning of the text. In order to realize this, all cue systems should process in harmony and provide readers with information in a balanced way. The harmonious processing of those systems can be explained with the following example. In a story called *Yasemin is at the Pastry-Shop*, the events of Yasemin's going to the pastry shop, buying some pastry, and having an accident are reported. In such a story, when the readers do not understand the word *package* in a statement in the story, *Uncle Hakkı helped the little girl package the pastries*, they involve in the following processes:
(1) When the readers confront with a word they do not know such as *package* they work out the necessary information from the text and make guesses using the graphophnonics system.
(2) Readers' syntax helps them guess which words can be suitable for this particular sentence. Readers think that there is a *noun* after the word they do not know, so it can be a *verb*. However, this operation is not done consciously. Readers, as natural and proficient speakers, make improvisations without saying anything about these operations using their information on grammatical rules.
(3) Semantics help readers select words by checking other words within the statement and relating them to the subject of the story. Thus, the word to be used before *the pastries* is guessed. Guesses could be like *eat; sell* or *package*.
(4) Pragmatics narrows down the choices made by the reader in accordance with the content of the story along with the social status of the characters. What can Uncle Hakkı do to help the little girl? *Put the pastries in a basket*; *package them*,; *cut them*, etc.
(5) The graphophonics system is used again and the first letter of the word is checked, then the visual information is controlled again. Among the selections that are narrowed down, the most appropriate one is chosen. Readers can use everything they know from the beginning of the story, check the letters and can understand that the word is not *eat* or *sell* but *package*. All decisions are made simultaneously within a short span of time. Readers use the strategies of confirmation, inference and guessing along with the cue systems of the language. The decision comes out itself and appears all of a sudden (Davenport, 2002).

Evaluation of miscues made during oral reading helps researchers observe all these operations occurring in readers' minds and understand the strategies readers employ to construct the meaning. These miscues are generally an internal part of meaning construction process from the text. In miscue analysis, children are observed while they are interacting with the text and an inventory of their mistakes is prepared. Through observation of these mistakes, children's syntax, semantics, pragmatics and graphophonics knowledge is determined. Besides, their skills and strategies regarding their comprehension of what they read are determined through the procedure of retelling, question-and-answers and fill-in-the-blanks activities. Standardized tests concentrate on the products of reading whilst miscue analysis examines the active meaning construction process employed by readers to work out the meaning (Goodman, 1995). Thus, the reading needs of learners at any age can be determined. Important oral reading miscues are as follows: Replacing a word with something else (substitution), adding a new word (addition), skipping a word or phrase (omission), correcting

a mistake while reading (correction), repeating the word or phrase (repetition) (Goodman, 1995; Goodman et al., 1987).

Informal Reading Inventory

Miscue analysis can be used in all types of reading methods. Students' development at all levels from beginners to advance can be observed and determined (Shanker & Ekwall, 2000). In order to observe students' development, it is important to choose reading materials suitable for their levels. Previous research suggests that in miscue analysis, students' strategies are mostly determined using reading materials at their instructional levels (Chaleff & Ritter, 2001; Paul, 1998; Wilhelm, 2001). In order to evaluate students' in terms of the reading materials in line with their instructional levels, ready informal reading inventories can be used or a new reading inventory can be developed by the teacher.

In the informal reading inventory, students' reading comprehension knowledge is scrutinized through registering qualitative and quantitative data whilst they are retelling what they read, answering the questions and filling in the blanks in the reading material. Evaluations are diagnostic since reading inventories are generated in order to meet the needs of each student. Thus observations cannot be compared with each other. The most important characteristic of the informal reading inventory is that they are based on observations and they provide information about the cognitive characteristics of the readers. Therefore, collected data is valid for a single student whilst it is not useful to comment on the performance of other students. Another reason to use reading inventories is to document the reading developments of students. These inventories are teacher-controlled and child-centered. They provide useful information to teachers about students' developments and give parents information about the students' achievement levels and necessary skills to develop them (Gillet & Temple, 1990; Miller, 2001). Many informal reading inventories provide ready word lists, questions and answers to control reading comprehension, forms for student stories based on reading and fill-in-the blanks forms that are suitable for different levels from pre-school to 8th grade.

Preparation of Informal Reading Inventories

Development of informal reading inventories involves two phases. First, the material in the inventory is developed. In this phase, reading materials are selected, reading comprehension questions and answers are developed, the evaluation form for the retelling procedure is generated and fill-in-the-blanks papers for each text are prepared. In the second phase, the material is piloted and applied.

In teacher-made informal reading inventories, texts can be selected from story books or texts similar to those used in the school. Texts in published inventories are either selected from story books or prepared particularly for the tests. Selecting and using the same stories or texts used in the classroom can interfere with the evaluation of students and mislead teachers in understanding students' development of reading strategies (Gillet & Temple, 1990).

While conducting the miscue analysis, what is criticized most is the selection of the texts. The purpose of selecting texts is to use a reading material which is suitable for students' instructional level so that students can read them fluently and understand it using self-guiding and correction strategies (Jensama, 1980; LaSasso & Swaiko, 1983; Paris, 2002). For instance, a reading material which is assumed to be easy for a student can be difficult to him when the subject matter is fishing. This is because a student who is not living by the sea or who does not have experience in fishing can have problems in understanding the terminology in an unfamiliar subject. Informal reading inventories should contain interesting, authentic, correct dialogs, descriptions and subjects students can recognize and understand. The text should constitute a whole in itself. It should not be an extract taken from the middle of a story.

Since instructors working with hearing impaired students cannot get sufficient information regarding the evaluation of students' reading comprehension based on standardized norm-

referenced tests (Jensema, 1980), they can acquire more information through the application of this child-centered evaluation approach to hearing impaired children. When the studies involving miscue analysis are examined, it is seen that there are few studies conducted with hearing impaired students. Ewoldt (1981) examined the reading process of four hearing impaired students with serious hearing loss aged between 7 and 17 who are being trained through the total communication approach. Students read 25 stories and were asked to tell the stories with American Sign Language (ASL). Besides, reading comprehension and fill-in-the-blanks exercises were conducted. It was found that hearing impaired students can understand what they read, have similar reading behaviors as their hearing peers and can use language cue systems (i.e. syntax, pragmatics, graphophonics) when they are given materials suitable for their current levels.

Chaleff and Ritter (2001) studied with hearing impaired students with serious hearing loss aged 5, 7 and 12 who were trained with the total communication approach. After determining students' miscues, those miscues were reviewed working individually with each student and focusing on the reasons behind the miscues. It was found that hearing impaired students used language cue systems; however, their reading comprehension skills were worse than their peers. Reading process of hearing impaired students who were trained through auditory-oral approach was not evaluated through the miscue analysis.

In Turkey, reading evaluation of hearing and hearing impaired students through miscue analysis was not conducted yet. Besides, there is not any informal reading inventory generated for either intact or hearing impaired students. However, reading comprehension has been examined through the retelling procedure (Girgin, 1999) and question-answer method (Akçamete, 1999; Girgin, 1987; İçden, 2003; Tüfekçioğlu, 1992).

This study is conducted in order to meet the need for the development of a reading evaluation material, selection of the type and basic characteristics of stories for inclusion in the material, application of those stories and interpretation of the results. Reading development and strategies of 8th graders are determined through the miscue analysis involving reading comprehension, question-and-answer and fill-in-the-blanks using complex stories organized in accordance with students' reading levels. The reason to choose 8th graders is to evaluate the reading comprehension strategies of students who have been trained with auditory-oral approach since 3 year-old, to determine their reading development levels, to understand the contribution of the education they receive and to determine what should be done in further Turkish courses they are going to take. Besides, it is hoped that sharing the findings with the families will enlighten their parents for their further educational decisions.

The purpose of the current study is to evaluate the reading comprehension of 8th graders, who are being trained through auditory-oral approach, by using complex stories and the miscue analysis. The research questions are as follows

1- To what extent do hearing impaired 8th graders use the language cue systems (i.e. syntax, semantics and graphophnonics)?
2- What is their reading comprehension level?
3- Is there a consistency between the miscues they make and their reading comprehension?

Method and Procedures

Participants

The current descriptive study is conducted with 10 students studying in the Research and Preschool Education Center for Children with Hearing Impairment at Anadolu University (i.e. İÇEM). İÇEM is an educational institution, where hearing impaired children are diagnosed at an early age and trained during daytime through auditory-oral. Data were collected in May 2005. The demographic information regarding participants is provided in Table 1.

Table 1
Demographic information of the participants

Participant ID	Date of Birth*	Gender	Hearing Loss (dB)
1	February 21, 1990	Female	108
2	April 1, 1990	Female	96
3	May 28, 1990	Male	103
4	June 8, 1990	Male	114
5	September 9, 1990	Male	89
6	October 5, 1990	Female	100
7	October 24, 1990	Male	89
8	November 29, 1990	Male	100
9	December 1, 1990	Male	107
10	June 28, 1991	Male	90

*Participants' dates of birth are chronologically ordered.

Except for the 2nd participant, all students were diagnosed at the İÇEM audiology clinics and fitted with proper hearing aids. Their families had got parent guidance three years. They started the nursery school of İÇEM at the age of four and received education for there years through İÇEM and at the same time their parents went on parent guidance program. When they are 6, they started elementary school at İÇEM and finished K-8 in 2005. The 2nd student in Table 1 was diagnosed at İÇEM and her/his parent had got parent guidance to; however, she did not get training at İÇEM's nursery school. She/he got her/his education in the integration classes till the 5th grade. She/he went on her/his education 6th through 8th grades at İÇEM. Besides, the 1st student received cochlear implant after the 6th grade. None of the students had a second physical handicap and none of their parents was hearing impaired.

Data Collection

Determining the Stories and their Levels

Since there is not any ready informal reading inventory in Turkey, texts at different levels used in the study, reading comprehension, question-answer and fill-in-the-blanks forms used were prepared by the researcher. It is emphasized that texts used in the miscue analysis should be prepared in terms of three levels namely, independence, instruction and frustration. Besides, it is important that texts should contain interesting and authentic dialogues, correct descriptions and subject-matters, and characters that are understandable and familiar to children (LaSasso & Swaiko, 1983; Paris & Carpenter, 2003; Woods & Moe, 1989). Therefore, texts that are familiar, appropriate, interesting and likeable were selected through screening elementary school Turkish course-books and through asking elementary school Turkish teachers to get expert opinion. According to teachers, students read complex stories. Complex grammatical structures, words, idioms and concepts were reviewed, and unfamiliar items, statements and words were revised. During these revisions, it was considered that short texts reduce the chance of working out the meaning from the clues whilst long texts place a burden on students' memories (LaSasso & Swaiko, 1983). The titles of the stories were as follows: *At the Zoo, The Child and the Tree, The Lost Bag,* and *The Heron*.

Complex stories have different characters experiencing a couple of problems, a large number of solutions for the problems, and a large number of suggestions made as solutions (Gillet & Temple, 1990; Hughes, Mc Gillivary, & Schmidek, 1997). The integrity of the selected stories was determined in accordance with the grammars of the stories. Thus, contexts of the stories (i.e. time, place, and characters), problems, reactions, scenarios, interferences, the results of the interferences, and results statements were determined (Gillet & Temple, 1990). After determining these statements, a consensus between independent raters was reached in order to increase reliability. The reliability was calculated through dividing the number of identical ideas to the sum of identical and different ideas and multiplying the result by 100 (Tekin & Kırcaali-İftar, 2001). All reliability indices in this study were calculated through this formula.

The reliability indices of the consensus between the raters for four stories, namely, At the Zoo, The Child and the Tree, The Lost Bag and The Heron were 82 %, 80, 82 % and 92 % successively.

In order to determine the difficulty level of the stories, the average lengths of the T-units are examined. T-unit refers to every single main clause and all other subordinate clauses related to that main clause (Hughes et al., 1997). The T-units in the stories were determined first. Then, the reliability indices for the consensus between the raters were calculated, which were, 82 % for At the Zoo, 80 % for The Child and the Tree, 82 % for The Lost Bag and 84 % for The Heron. The average lengths of the T-units were calculated through dividing the total number of words in a story to the number of T-units. If the average lengths of the T-units increase, the complexity of the story increases as well (Hughes et al., 1997). Table 2 provides the average lengths of the T-units.

Table 2
The average lengths of T-units in the stories

Name of the Story	Total Number of words	Total Number of T-units	Average lengths of T-units
At the Zoo	227	31	7
The Child and the Tree	253	35	7
The Lost Bag	324	38	8,5
The Heron	265	26	10

When Table 2 is examined, it is observed that At the Zoo and The Child and the Tree are at the simple level, The Lost Bag is at the instructional level and The Heron is at the frustration level. In order to determine the difficulty of the stories, subordinate clause index was calculated as well. The subordinate clause index was found through dividing the total number of clauses to the total number of t-units. The result of the division is always higher than 1.0 since every T-unit has at least one clause. If the result digresses from 1.0, the difficulty of the statements increases as well (Hughes et al., 1997). Table 3 provides the subordinate clause indices of the stories.

Table 3
Subordinate clause indices of the stories

Name of the Story	Total Number of Clauses	Total Number of T-units	Subordinate Clause Index
At the Zoo	70	31	2,25
The Child and the Tree	82	35	2,34
The Lost Bag	85	38	2,23*
The Heron	79	26	3,10

When the subordinate clause indices are examined, it can be observed that the subordinate clause index of The Lost Bag is smaller than that of The Child and the Tree. However, in order to determine the difficulty of a story, it is important to conduct further analyses. One of those analyses is to concentrate on different words. Stories that do not repeat the same words and use different words are more difficult. To determine the word difference, all words are counted within a story. When a word occurs again, it is not counted as a different word. To count a word as different, it should occur in the text for the first time. To find the words' difference index, the total number of different words in the story is divided by the square root of twice the total number of words (Type-token ratio). (Woods & Moe, 1989; 13). Table 4 provides the difference indices of the stories.

Table 4
Difference indices of the stories

Name of the Story	Total Number of Words	Total Number of Different Words	Words' Difference Index
At the Zoo	227	165	7,7
The Child and the Tree	253	171	7,6
The Lost Bag	324	228	8,9
The Heron	265	223	9,6

According to Table 4, the first two stories are at the independent level, the third one is at the instructional level and the last one is at the frustration level. After examining the text difficulty of the stories, retelling forms for each story were developed. The retelling form was developed in accordance with that of Ewoldt (in Thackwell, 1992). This form was comprised of three sections. In the first section, characters in the story were written and graded in accordance with their importance total score being 25 points. In the second section, important events were written, each event was graded and a total of 50 points was given. In the third section, details in the story were written, each detail was graded and a total of 25 points was given. After the retelling forms were prepared by the researcher, a consensus between independent raters was reached for reliability. The reliability indices were 80 % for At the Zoo, 81 % for The Child and the Tree, 81 % for The Lost Bag and 84 % for The Heron.

While preparing the questions and answers, three types of questions were asked. Questions that had an identical answer within the text, questions that did not have an identical answer but could be inferred from what is within the text, and finally questions that required children to integrate their experiences with the information provided in the text to answer the questions (Miller, 2001). A total of 10 questions were asked four of them having identical answers, four being inference questions and two requiring children to use their background knowledge along with the information provided in the text. Each question was worth 10 points. The reliability indices of all stories in terms of the questions and answers were 100 %.

While preparing the fill-in-the-blanks papers, every 5^{th} word were deleted from the text (LaSasso, 1980). The first two sentences in the first paragraph and the last two sentences in the last paragraph were left intact so that they could provide clues to students. While deleting every 5^{th} word, the next or the previous words was chosen whenever the same word occurred as the 5^{th} word. Students were expected to fill in the blanks with the exact words occurred in the story. However, when they wrote a meaningful and suitable word which did not change the meaning of the sentence, the response was accepted (Thackwell, 1992). This procedure measures the readers' skills to work out the meaning regarding the whole story and to guess the statement structure (Miller, 2001; Thackwell, 1992). Before the stories were developed and the data were collected, the stories were piloted with four 6^{th}, 7^{th} and 8^{th} graders who did not have a hearing impairment along with five hearing impaired 7^{th} graders who did not participate in the study. This process elaborated the process of application.

Application

Applications are conducted through working with each student individually. Data were collected by experienced researcher in terms of working with the hearing impaired in a soundproof room. While collecting data, according to students' reading proficiency levels, 40 to 60 minutes were given to students for reading, filling in the blanks, reading comprehension and answering the questions. Students who asked for extra time were given an additional 10 minutes. In order to make the application more effective, the followings were taken into account:

(1) While determining the story to be read by students, they were asked to start from the story which was supposed to be at their instructional levels. In order not to give clues to the

students, the fill-in-the-blanks forms were given before they were exposed to oral reading and they were asked to read the story silently and fill in the blanks. When students asked for help while filling in the blanks, they were not supported but encouraged to reread and review the story from the very beginning to the end (Thackwell, 1992).
(2) After the fill-in-the-blanks part was over, oral reading started. A copy of the story was used by the researcher to follow the reading of students so that she could check the miscues (Davenport, 2002).
(3) After the oral reading, students were asked to retell what they had read. Students were not asked questions while reading; however, they were encouraged with statements such as *What happened next?; Good for you!; Proceed, please!* If students could not retell what they read, a lower level of story was selected supposing that the level of the story was hard for them.
(4) After retelling procedure, question-and-answer section was applied. Students' answers were taken down by the researcher. Whenever students did not understand a question, the question was repeated and every single thing student said was documented. The whole procedure was video-recorded to sustain the objectivity of the data. For each student, a dataset was generated containing miscues during oral reading, reading comprehension, question-and-answer and fill-in-the blanks. The analysis of this dataset is explained below.

Data Analysis
In order to answer the first research question, that is, to determine the extent to which students use syntax, semantics and graphophnonics, an inventory of their miscues was prepared. Statements within the story were numbered (i.e. 1st sentence, 2nd sentence) and double-checked through watching the video-recordings. After determining the miscues, they were examined to see whether they violate the syntax, semantics, and intended meaning of the statement. Besides it was also checked whether there was a similarity in terms of graphophnonics between the words students produced and the actual words occurring in the text. Percentages were calculated for above indices.

Before calculating the percentages;
(a) it was checked whether each miscue violated the syntactic correctness of the statement or not. If it did not change the syntax for the worse, or if the syntactic structure of the statement was still all right after the miscue, the statement correctness column was marked with *yes*.

(b) It was checked whether the statement carried a meaning after the miscue. If it carried a meaning, the semantic correctness column was marked with *yes*. For instance, while reading the 7th sentence of The Heron, *Şu gölde nesilleri kuruyacak (i.e. their generation will become extinct in this lake)*, the 7th student read the word *nesilleri* (i.e. their generation) as *nesler*i. Even though he said a pseudo word rather than *nesilleri* the rules of syntax were not violated. However, the sentence was turned into *Şu gölde nesleri kuruyacak (i.e. their <u>nesleri</u> will become extinct in this lake)*. When the sentence was examined to see whether it still had a meaning, it was observed that it had a meaning even thought a nonsense word was used. However, what would become extinct was uncertain. Thus, the column labeled *does it have a meaning* was marked with *yes*.

(c) It was checked whether the miscue, the word *nesleri*, violated the actual intended meaning of the author. The author tries to explain that the heron generation will become extinct. With the miscue, the intended meaning was replaced with a defective meaning. Thus, the cell regarding whether the miscue changed the actual intended meaning of the statement was marked with *yes* with a comment *partially changed the intended meaning*.

(d) The similarity of graphophonics between the uttered word and the actual word was checked. If there were differences involving just one or two letters, the words were considered highly similar. If the differences involved two or three letters, the words were considered moderately similar. Finally, if there were more differences, *there were no similarities* column was marked (Davenport, 2002).

After asking above questions and marking relevant columns with either *yes* or *no*, the percentages of syntactic acceptability, semantic acceptability, and the possibility of changing the author's intended meaning was calculated. In this calculation, the number of syntactically correct statements was divided by the number of total statements and multiplied by 100 to find the *syntactic correctness percentage*. Similarly, the number of semantically correct statements was divided by the number of total statements and multiplied by 100 to find the *semantic correctness percentage*. Finally, the number of statements whose meanings were changed was divided by the number of total statements and multiplied by 100 to find the *meaning change percentage* (Davenport, 2002).

While finding the percentages of graphophnonics similarities, deletions, additions, self-corrections and repetitions were not considered (Davenport, 2002). Letter and sound similarities were examined in cases of substitutions. In order to find the percentages, the number of letter-sound similarities in the miscues was calculated first. Within these miscues high letter-sound similarities were determined. The total number of high letter-sound similarities was divided by the total number of similarities and multiplied by 100 to determine *high letter-sound similarity*. Similarly, the total number of moderate letter-sound similarities was divided by the total number of similarities and multiplied by 100 to determine *moderate letter-sound similarity*.

In order to answer the second research question (i.e. what is their reading comprehension level?), students' scores on reading comprehension, question-and-answer and fill-in-the-blanks sections were calculated. To calculate the reading comprehension scores, video recordings were watched again. Expressed characters, basic events and details were marked and the scores were calculated on the reading comprehension evaluation from.

For the fill-in-the-blanks scores, words written in the blanks were examined under three headings.
(1) Correct responses were determined to calculate fill-in-the-blanks point. When the students wrote the very same word in the story, this was accepted as a correct response and the total of those responses were written to the correct responses column.

(2) If students did not write the very same word while filling in the blanks, but wrote something that did not change the meaning of the statement, this response was accepted as correct as well. The total of these responses were written to the *different but does not change the meaning* column.

(3) Words that changed the meaning and that were wrong were determined, and the total of those words were written to the *not correct, changes the meaning* column. The number of correct responses was divided by the number of blanks and multiplied by 100 to find the correct response percentage. The percentages of the second and the third group were found via this method as well (Thackwell, 1992). The dataset belonging to 30 % of the students participated in the study was controlled by another expert in the field and the reliability between the raters was found as 100 %.

Results

Each student participated in the study read the stories at an instructional level in which they could read fluently, correct their miscues, self-guide during reading and work out the intended meaning (Table 5)

Table 5
Stories read by the participants

Order	Participant	Name of the Story
1	1st participant	The Lost Bag
2	2nd	At the Zoo
3	3rd	The Heron
4	4th	At the Zoo
5	5th	The Lost Bag
6	6th	The Heron
7	7th	The Heron
8	8th	The Child and the Tree
9	9th	At the Zoo
10	10th	At the Zoo

When the stories read by the students are examined, it can be seen that that four students read "At the Zoo", two students read "The Lost Bag", three students read "The Heron", and one student read "The Child and the Tree".

The first question focusing on the extent to which hearing impaired 8th graders use language cue systems (i.e. syntax, semantics and graphophonics) during reading was answered with percentages in Table 6.

Table 6
Percentages of students' use of syntax, semantics and graphophonics

Participant	Name of the Story	Number of T-units	Syntactic Correctness (%)	Semantic Correctness (%)	Meaning Change (%)	Letter-sound similarity (similarity of graphophonics) (%)
7th participant	The Heron	26	100	96	96	100 high
3rd participant			96	96	96	75 high / 25 moderate
6th participant			100	100	88	100 high
5th participant	The Lost Bag	28	100	100	94	100 high
1st participant			100	100	94	100 high
2nd participant	At the Zoo	31	100	90	87	85 high / 15 moderate
9th participant			96	96	90	50 high / 50 moderate
4th participant			96	96	96	100 high
10th participant			100	100	87	80 high / 20 moderate
8th participant	The Child and the Tree	35	97	97	94	100 high

When Table 6 is examined, it can be seen that all students participated in this study could use the language cue systems (i.e. syntax, semantics and graphophonics) during instructional level story readings. The amount of miscues students made during reading changed the syntactic structure and meaning correctness at an extent between 96 % and 100 %.

In order to answer the second research question, in other words, to determine students' reading comprehension levels, reading comprehension, question-and-answer and fill-in-the-blanks scores were examined. Reading comprehension scores of the students are provided in Table 7.

Table 7
Reading comprehension scores of the students

Participant	Name of the Story	Characters (25 points)	Basic Events (50 points)	Details (25 points)	Total
7th participant	The Heron	25	43	20	88
3rd participant		25	38	8	71
6th participant		25	35	10	70
5th participant	The Lost Bag	25	30	15	70
1st participant		25	45	18	88
2nd participant	At the Zoo	21	31	3	55
9th participant		24	34	3	61
4th participant		21	34	16	71
10th participant		24	41	13	78
8th participant	The Child and the Tree	25	30	15	70

As the Table 7 indicates, except for the 2nd student, all students mentioned characters and received either 24 or 25 points on this part. While talking about the characters, the 2nd student did not mention *the turtle, the bird, the monkey, the rabbit, and Atatürk Forest* and received 21. When the basic events are examined, it is observed that the 2nd student got the lowest score (31 out of 50) again whilst the 7th student got the highest score (43 out of 50). When students' points on details are examined, it is observed that the highest score was received by the 7th student whilst the lowest scores were received by the 2nd and 9th students. When the total scores are examined, it is observed that all scores were above 50, highest score belonging to the 7th student whilst the lowest one belonging to the 2nd student. Students' question-and-answer scores are given in Table 8.

Table 8
Students' question-and-answer scores

Participant	Name of the Story	QUESTIONS										
		1	2	3	4	5	6	7	8	9	10	Total
7th participant	The Heron	10	0	10	10	5	5	10	10	10	10	80
3rd participant		10	10	5	10	5	5	5	10	10	5	75
6th participant		5	10	0	10	5	10	10	5	10	10	75
5th participant	The Lost Bag	10	10	10	5	5	10	0	10	10	10	80
1st participant		10	10	10	7,5	5	10	0	7,5	10	10	80
2nd participant	At the Zoo	0	0	7,5	10	0,5	5	5	5	10	10	60
9th participant		10	10	7,5	5	10	10	5	5	7,5	10	80
4th participant		10	5	7,5	10	7,5	5	10	0	10	10	75
10th participant		10	10	7,5	5	5	10	7,5	5	10	10	80
8th participant	The Child and the Tree	5	10	10	5	10	5	0	7,5	5	10	70

When Table 8 is examined, it is seen that students answered the questions with direct and clear answers. However, the 7th student who read The Heron did not understand the 2nd question, *Why did the heron make a plan?*, and could not give the answer *He was too old to go fishing and understood that he would die, so he made a plan* which was directly provided within the text. The 6th student did not understand the 3rd question, *Why did the crab tell herons about the danger?* Moreover, she did not understand the meaning of the statement *Şu*

gölde nesilleri kuruyacak (i.e. their generation will become extinct in this lake). Even though she read the statement correctly, she inferred the meaning that the lake itself will become extinct. Thus she gave an answer like *the lake is going to dry, fish must go somewhere, they should not disappear*. However, the right answer was *He understood that he would be hunted with the fish by the hunters*.

All students understood the inference questions and answered them right except for a few of them. For instance, the 5th question in The Heron *What was the heron's plan* should be answered like *To cause fish to move and eat them while they are moving*. The 7th student answered this question as *He tells them to hide in a larger river; however, the fish does not know how to go there. So, he tells that he can carry them there in his mouth. However, he tells a lie, goes to the forest and eats them with pleasure*. Since the student mentioned *eating fish*, he was given half a point. The 5th student answered the same question as *To eat the fish, to eat the crab, eat them all and deceive them*. Since he did not mention *to cause the fish to move* but just eating fish, he was given half a point as well.

The 5th student who read The Lost Bag had problems in answering the 7th inference question *Why did not Berk get upset about not finding his bag?,* which should be answered as *He was not upset, because he thought that the bag was in the class* or *he thought that he would find the bag in the class the next day*. The 5th student answered this question as *He was not aware that he forgot the bag in the class, so he did not get upset*. The 1st student answered the very same question as *Because Berk has another old bag*. The answer was not correct.

All students correctly answered the questions that required children to integrate their experiences with the information provided in the text. When their scores are examined, it is observed that they got scores between 70 and 80. The fill-in-the-blanks scores of the students are provided in Table 9.

Table 9
Students' fill-in-the blanks scores

Participant	Name of the Story	N of blanks	Correct Responses (%)		Different but do not change the meaning (%)		Different and change the meaning (%)		Correct Response + Differences that do not change the meaning (%)	
7th participant	The Heron	43	20	47	18	42	5	11	38	89
3rd participant			12	28	15	35	16	37	27	63
6th participant			13	30	14	32	16	37	27	62
5th participant	The Lost Bag	45	18	40	20	44	7	15	38	84
1st participant			21	47	17	37	7	15	38	84
2nd participant	At the Zoo	36	3	8	16	44	17	47	19	52
9th participant			5	14	19	52	12	33	24	66
4th participant			12	33	14	39	10	27	26	72
10th participant			9	25	12	33	15	41	21	58
8th participant	The Child and the Tree	29	7	24	14	48	8	28	21	72

When students' correct responses are examined, it is observed that the 7th student got the highest score whilst the 2nd student got the lowest score. However, when the words that did not change the meaning were considered as correct, students all had percentile scores exceeding 50 %. For instance, the 9th student who read At the Zoo replaced the word *first* with the word *all* and the meaning slightly shifted from *They first visited the nests* to *They visited all the animal nests*. This did not violate the syntactic correctness and the meaning of the statement, so this response was considered correct. Moreover, he replaced the word

monkeys with *squirrels* and the meaning shifted from.. *they saw colorful birds, turtles, monkeys,* to .. *they saw colorful birds, turtles, squirrels*, which did not violate the syntactic and semantic correctness of the statement, either. However, the same student replaced the word *visited* with *blue* which violated the meaningfulness of the statement and that statement was considered wrong.

To examine the last research question of the study (i.e. is there a consistency between the miscues they make and their reading comprehension?), their syntax, semantics, and graphophonics percentages were provided along with their reading comprehension, question-and-answer, and fill-in-the-blanks scores (Table 10)

Table 10
Percentages of students' use of syntax, semantics and graphophonics along with their reading comprehension, question-answer and fill-in-the-blanks scores

Participant ID	Name of the Story	Number of T-units	Syntactic Correctness (%)	Semantic Correctness (%)	Meaning Change (%)	Letter-sound similarity (similarity of graphophonics) (%)	Reading Comprehension Score*	Question-and-answer Score*	Fill-in-the Blanks Score*
7	The Heron	26	100	96	96	100 High	88	80	89
3			96	96	96	75 High 25 Moderate	71	75	63
6			100	100	88	100 High	70	75	62
5	The Lost Bag	28	100	100	94	100 High	70	80	84
6			100	100	94	100 High	88	80	84
2	At the Zoo	31	100	90	87	85 High 15 Moderate	55	60	52
9			96	96	90	50 High 50 Moderate	61	80	66
4			96	96	96	100 High	75	75	72
10			100	100	87	80 High 20 Moderate	78	80	58
8	The Child and The Tree	35	97	97	94	100 High	70	70	72

When Table 10 is examined, it is seen that when students read a story at the instructional level, there occurred a consistency between their use of language cue systems (i.e. syntax, pragmatics, and graphophonics) and their reading comprehension, question-and-answer and fill-in-the-blanks scores.

Discussion and Suggestions

Determining the miscues students make while reading do not completely explain their reading process (Hempenstall, 1999). However, it gives opportunities to evaluate their oral reading and meaning construction knowledge. This information is used to determine the objectives of reading education and to support students. Besides, it helps learners to evaluate themselves and have self-esteem (Chaleff ve Ritter, 2001).

Findings of the current study revealed that hearing impaired students trained through the auditory-aural approach could use the language cue systems (i.e. syntax, semantics, and graphophonics) when they read a story at the instructional level. This finding is in line with the findings of studies conducted with hearing impaired students (Ewoldt; 1981; Yurkowski & Ewoldt, 1986; Chaleff & Ritter, 2001). Similar to the current study, those studies emphasized that students should read stories at their current level that they can read fluently, correct and self-guide themselves while reading.

When students' retelling scores were examined, it was observed that their scores on retelling were higher than 50 out of 100. Using Ewoldt's retelling evaluation tool (in Thackwell, 1992), it can be stated that students use reading strategies efficiently, retell important events,

understand the gist of the stories most of the time, retell the important figures along with the changes in those figures. When students' question-answer scores were examined, it was seen that they could answer questions, which had direct and identical answers within the text whilst they were having problems with some of the inference questions. Based on their answers on the third type of question, it can be said that they can integrate their prior experiences with the information given in the text (İçden, 2003). When students' responses in the fill-in-the-blanks activities were examined, which evaluated students' knowledge on sentence structure, grammar and comprehension; it was seen that the percentage of writing the identical word in the story was quite low. Students could not remember some of the words in the story; however, they wrote different words that did not change the meaning of the statements, which were accepted correct (Thackwell, 1992). Students' scores were 50 or higher. Thus, it can be stated that students remember important events and details in the story and they can use their knowledge regarding the sentence structure and grammar.

There was a consistency between the mistakes students made and their reading comprehension. They usually repeated the reading mistakes during retelling and answering the questions as well (Davenport, 2002).

Further research with these students who can use syntax, semantics and graphophonics should concentrate on their use of graphophonics knowledge, because most of the mistakes they made resulted from using suffixes. For example they said *kaçını* rather than *kaçınızı*, *bekliyorlar* rather than *bekliyorlarmış*. It should be emphasized in Turkish and grammar courses along with other courses where necessary that the whole word should be taken into account rather than the beginning of the words, since the suffixes can change the meaning of words or statements. Besides, students' language use and reading comprehension should be further examined through individual and group studies evaluating their written and oral language. Because, students are likely to confront with difficulties in reading the structures of a language, whose written and oral forms are understood and used with difficulty.

When students' reading scores were examined, it is observed that the 2nd student had lower scores. This reveals that the story she read (i.e. At the Zoo) was not at her instructional level. Including easier stories within the reading inventories is important to determine students' exact reading proficiency levels and to sustain ideal instruction within the class. The fact that the 2nd student had lower scores in reading comprehension might be because of the training she has received, because she had training in the immersion class till the 6th grade. Since the classes are too large at the elementary level in Turkey, it is quite difficulty to arrange the curriculum in line with the individual characteristics of the children. Thus, it can be said that students with serious hearing loss cannot attain experiences and skills necessary to improve their reading strategies. The reading curriculum should be developed and implemented based on the observations regarding students' individual characteristics and achievement levels. Even though the miscue analysis is an evaluation method requiring a lot of time, it profoundly investigates students' reading comprehension and reveals each student's strengths and weaknesses. Thus, it accelerates the process of teaching reading strategies along with the development of language cue systems.

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