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National Estonian-language tests: What is measured in text comprehension tasks?

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Abstract

Text comprehension includes different components to create a coherent whole. The comprehension tasks of the national Estonian-language tests for Grades 3, 6 and 9 (10-, 13- and 16-year-old students) were analysed to find out the similarity in the distribution of tasks at different comprehension levels for the same grade in consecutive years and if the text comprehension levels in the tests for different grades changed. Deductive content and descriptive analyses were used to find out how comprehension was measured in the national Estonian-language tests. We found that there was no consistency in the tests for the same grade in different years. Additionally, in most cases, the students' cognitive growth was not considered: the tests for younger students included more inferential and evaluative level tasks than the tests for older students. Although it is important to improve comprehension skills at every level, the emphasis in tests should move from literal to inferential and evaluative tasks in the older age group.

Keywords: Text comprehension levels, text comprehension components, national tests, text comprehension tasks, primary school.

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1. Introduction

Text comprehension is a prerequisite skill for successful academic growth in school. Comprehension includes interactive implementation of linguistic and cognitive processes and knowledge (Tennet, 2015) at literal, inferential and evaluative levels (Basaraba, Yovanoff, Alonzo & Tindal, 2013). The role of these skills changes over time: younger students' comprehension is more related to literal level skills, whereas older students' comprehension depends mostly on inferential and evaluative level skills. To track students' development, it is important to assess skills at every comprehension level, taking students' cognitive development into consideration (Oakhill, Berenhaus & Cain, 2015).

In many countries, text comprehension is assessed with special national comprehension tests (Tengberg, 2017; Vestheim & Lyngsnes, 2016). In Estonia, text comprehension is also measured by national assessments, together with other language skills, i.e., grammar and writing skills (Innove, 2013; 2014). Comparing Estonian students' text comprehension in national tests with the PISA (Programme for International Student Assessment) survey, considerable differences are apparent. According to the PISA 2015 survey results (Tire, 2016), only 11% of Estonian students are able to comprehend texts at the highest cognitive level (i.e., evaluate the text and integrate new information with previous knowledge). Conversely, students' average scores in text comprehension tasks in Estonian national tests have been very good (see Hennoste, 2014; 2015). The discord between the text comprehension results might be due to the different proportions of comprehension levels included in the assessments. PISA tests have a framework that prescribes the percentage of skills that are being measured (Organization for Economic Cooperation and Development [OECD], 2008). As there is no complete conception for assessing text comprehension in Estonia, it is unclear which comprehension components in national Estonian-language tests are measured and whether they are in accordance with comprehension theories and students' development (Karbla, Uibu & Mannamaa, 2018). Therefore, the information about comprehension tasks in national tests should be ascertained.

In this longitudinal study, the text comprehension tasks from the national tests for Grades 3, 6 and 9 (10-, 13- and 16-year-old students) in four years (2013–2016) were analysed. The aim of the study was to find out how similar the structure of the distribution of tasks at different comprehension levels between the tests for the same grade in different years was. In addition, the extent to which the distribution of comprehension levels changed among the tests in different grades over the years was a focus of this study.

1.1. Text comprehension levels

Text comprehension is a complex, multidimensional and dynamic process with the purpose of giving meaning to texts (Cain & Oakhill, 2009). Knowledge, cognitive processes, strategies and their integration are needed to understand words, sentences, paragraphs and the whole story (Oakhill et al., 2015). Texts can be comprehended at different levels depending on the skills that are being used in the comprehension process. For example, Basaraba et al. (2013) describe three comprehension levels: literal, inferential and evaluative. A similar classification is used in the documents of the National Assessment of Educational Progress (NAEP, 2008) and PISA (OECD, 2008). As students' reading experience and cognitive ability grow over time, the contribution of comprehension levels changes with age: older students' text comprehension is related to the inferential and evaluative levels to a greater degree (Oakhill et al., 2015).

Comprehending texts at the lowest, i.e., literal, comprehension, level is mostly related to linguistic components. At this level, readers understand the explicit information from texts (Kibui, 2012; NAEP, 2008) without integrating information in the text. Literal level tasks demand the reader finds the answer that is literally given in texts (Applegate, Quinn & Applegate, 2002). For example, in a text that includes the information 'Dad's car is broken, so he is late for work', the question at the literal level could be, 'Why was dad late for work?'. Asking questions only at the literal level might lead to a superficial reading (Butcher & Kintsch, 2012) that cannot be the goal of comprehension but rather an

input to the comprehension process. The focus on tasks at the literal level should decrease over time, and more attention should be paid to promoting students' higher level skills (Kibui, 2012), e.g., analysing information, giving reasons and explaining motives.

At the inferential level, readers analyse texts, make inferences about information provided in texts, compare various information, events and characters and integrate new information and prior knowledge into the coherent whole (Basaraba et al., 2013; Butcher & Kintsch, 2012). For example, the task at this level might be to explain why two characters of the story became friends (Applegate et al., 2002). Younger students' inferences rely more on concrete hints and questions and they use less prior knowledge (Cain, Oakhill & Lemmon, 2004), whereas older students use more information from texts, apply prior knowledge and form generalisations based on texts (Kibui, 2012). Comprehending texts and making inferences are facilitated by a clear text structure and students' knowledge about it (Oakhill et al., 2015).

While reading texts at the evaluative level, readers also need literal and inferential level skills (e.g., vocabulary, analysing the information and filling in gaps) and the ability to go beyond the text, compare and contrast new information to the prior knowledge, read between the lines and have an opinion about the author's intentions (Basaraba et al., 2013; Kibui, 2012). At the evaluative level, students can critically evaluate the texts' reliability and the quality of statements and arguments (NAEP, 2008; OECD, 2008). A question at this level can be, for example, 'If you were the teacher, which one of these students would you name the teacher's assistant? Justify your decision'. (Applegate et al., 2002). As younger students pay more attention to the concrete actions in texts, the evaluative level tasks should rely more on the text (e.g., making a schema). In time, the tasks could be more abstract (Van den Broek, 1997), for example finding the main idea of the text and evaluating and analysing the characters' motives.

In Estonia, students' abilities and academic outcomes in their native language are assessed with national tests at the end of every school level: in Grades 3, 6 and 9. National tests have two main purposes: to direct the teaching process and receive information to make educational political decisions. Therefore, national assessments should be compiled based on theory that considers students' developmental growth. Comprehension assessments should include tasks at all comprehension levels. Furthermore, tests for students of the first school level (Grade 3) should include more literal level and fewer inferential and evaluative level tasks. The focus in tests for the second and third school levels (Grades 6 and 9) should move more to assessing students' higher level skills, such as comparing, analysing and critically evaluating information in texts (Vabariigi, 2011).

1.2. Study objectives and research questions

To measure the students' text comprehension, it is important that the assessments include comprehension tasks at different levels and consider students' cognitive growth. The older the students are, the more inferential and evaluative level skills and fewer literal level skills should be assessed. Also, the tests should be comparable for the same grade, i.e., tests for Grade 3 should include a similar percentage of literal level tasks every year. In this study, the comprehension tasks from national Estonian-language tests in four consecutive years (2013–2016) for Grades 3, 6 and 9 were analysed. The aim of this study was to find out how similar the structure of distribution of comprehension levels between the tests for the same grade in different years was. In addition, we analysed to what extent the distribution of comprehension levels changed among the tests in different grades. The research questions were as follows:

1. How similar is the structure of the distribution of tasks at different comprehension levels between the tests for the same grade in different years?
2. To what extent does the distribution of comprehension levels change among the tests in different grades?

2. Method

2.1. Text comprehension tasks

Data included comprehension tasks from the national Estonian-language tests from 2013 to 2016 for Grades 3, 6 and 9. The tasks were compared in order to reveal the similarity among the tests for the same grade as well as the changes among the tests for the different grades. Altogether, 226 comprehension tasks were analysed. The Grade 3 tests included 78 comprehension tasks and the Grade 6 tests had 67 comprehension tasks. The most comprehension tasks (81) were in the tests for Grade 9. All the analysed tests were in a paper and pencil format. The 2016 test for Grade 6 was excluded because in that year the electronic version of the national test was piloted in Estonia.

The tasks for Grades 3 and 6 were based on both oral and written texts, whereas the Grade 9 tasks were solely about written texts. The analysed tests included tasks in various response formats, including multiple-choice, gap-fill, open-ended, true/false, generating questions, ordering sentences or paragraphs, finding main ideas and complementing a schema. Based on theory (Basaraba et al., 2013, NAEP, 2008; OECD, 2008), all the tasks were categorised into three categories: literal, inferential and evaluative comprehension levels. Figure 1 shows task category formation examples.

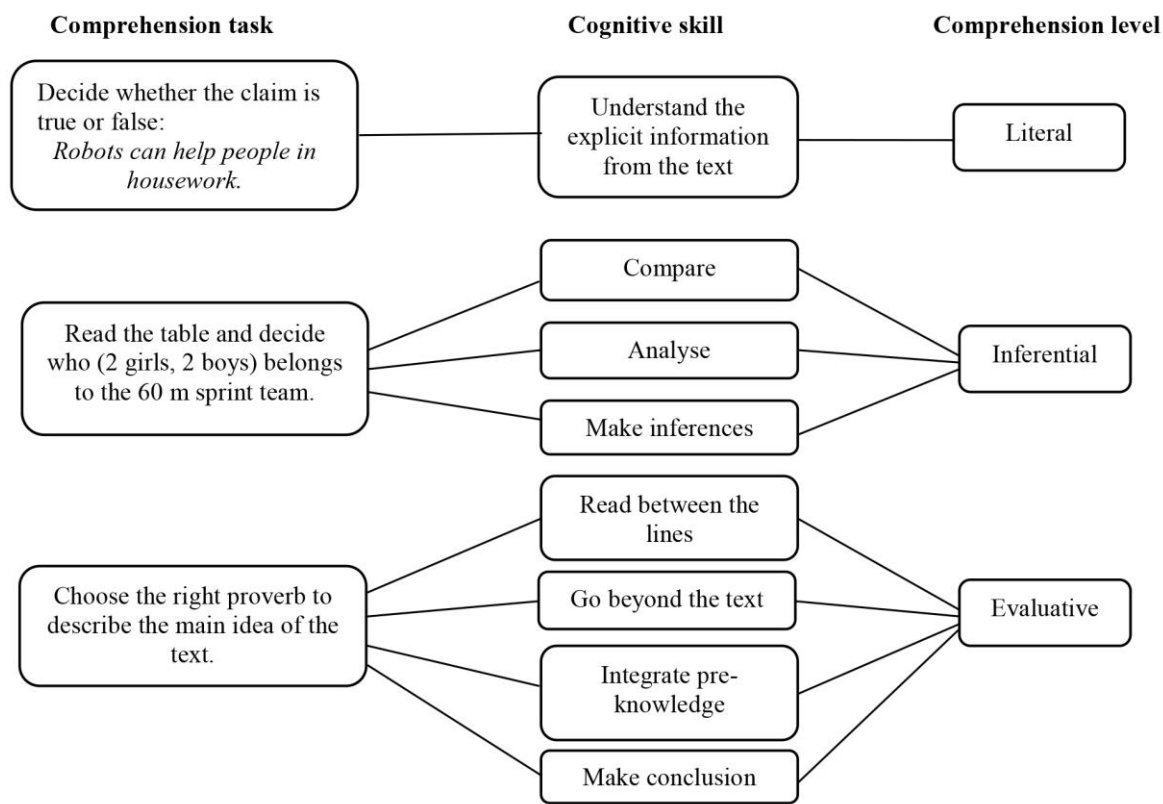


Figure 1. Examples of formation of the comprehension levels categories

2.2. Data analysis

The analyses of the tasks included qualitative and quantitative phases. In the qualitative phase, thematic analysis was used to divide the comprehension tasks into three categories: literal, inferential, and evaluative levels (see Basaraba et al., 2013; NAEP, 2008; OECD, 2008). The tasks were categorised into a literal level if they required remembering or understanding literal information from texts and making some easy inferences. For example, students had to understand that by *things* the *furniture* is meant. The instruction was to decide if the statement was true or false. The claim was, 'The fly thought that the *furniture* was glued to the ceiling'. The information in the text was, 'With glue! That is how people stick their *things* on the ceiling'. The tasks were categorised into the inferential level when they required students to compare, analyse, make inferences or integrate several propositions and draw logical conclusions from the information presented. For example, tasks where students had to order the paragraphs of the text into the right order were categorised as inferential level. Tasks were classified as evaluative level when students had to apply their pre-knowledge or information from the text to make judgements about the text. For example, the task where students had to name two characteristics that showed that the text was written as a diary was categorised into the evaluative level. All tasks were coded independently by the two authors and categorised into three more comprehensive categories. After the first coding, the authors compared their categorisation. In the case of disagreement between the authors, their decisions were reconsidered, based on the theory. As a result of the discussion, consensus was reached. In the quantitative phase, the data tables were compiled in Microsoft Excel and sum scores for every category were calculated and presented in the results.

3. Results

First, we assessed how similar the structure of the distribution of tasks at comprehension levels between tests for the same grade in different years was. We found that the focus was on different comprehension levels in consecutive years (see Table 1).

Table 1. The distribution of tasks (%) at different levels

Grade	Year	Comprehension level		
		Literal	Inferential	Evaluative
3	2013	31.8	59.1	9.1
	2014	63.6	18.2	18.2
	2015	66.7	27.8	5.6
	2016	56.3	37.5	6.3
6	2013	42.9	52.4	4.8
	2014	76.0	24.0	0.0
	2015	57.1	42.9	0.0
9	2013	43.5	52.2	4.3
	2014	64.0	24.0	12.0
	2015	45.0	35.0	20.0
	2016	52.6	47.4	0.0

For example, the Grade 3 test included 31.8% literal level tasks in 2013 but 63.6% the next year. The tasks at this level required students to understand the literal information provided in texts. A similarity in distribution of inferential level tasks for Grade 3 was not found, as it fluctuated between 18.2% and 59.1% in the examined years. Although the tasks at inferential level were mostly text-based, they required students to make inferences and analyse information in the text. One of the tasks at this level was about comparing information in a table and making a conclusion about students who learnt in the same grade. Regarding the evaluative level tasks, the tests for the years 2013, 2015 and 2016 ranged

from 5.6% to 9.1% for such tasks, whereas the test for 2014 contained 18.2% evaluative level tasks. All the Grade 3 tests included evaluative level tasks, unlike the tests for higher grades.

The distribution of levels varied also in the tests for Grade 6 in different years. Comparing the tests for Grade 6 we found that, in general, the main focus was on assessing students' literal level understanding. The percentage of these tasks varied from 42.9% to 76.0%. The distribution of tasks at the inferential level varied in consecutive years: in 2013 about half the tasks were at the inferential level, while in the next year these kind of tasks were less than a quarter (24.0%). In 2015, the distribution was again considerably higher: 42.9%. Unlike the Grade 3 tests, only one test for Grade 6 (2013) included evaluative level tasks. The only task at the highest comprehension level was about determining the text type. In this task, students had to implement their pre-knowledge about text types as well as find the necessary characteristics from text to make a decision.

The Grade 9 tests continued the same pattern: there was no consistency among the tests in different years. The 2014 test included 64.0% of literal level tasks but less than half these tasks in 2013 and 2016. There was also no similarity in distribution of inferential level tasks among different years: for example, these tasks were found to be 52.2% in 2013 but only 24.0% the next year. A great difference was found with regards to evaluative level tasks between the tests: in 2015 there were 20.0% of tasks at the highest level but none in 2016.

Second, we analysed to what extent the distribution of tasks at different comprehension levels changed among the tests in different grades. Analysis revealed changes that were not in accordance with students' cognitive development in most of the years (see Table 1). For example, the 2013 Grade 3 test included fewer literal level tasks (31.8%) compared to the tests for Grade 6 (42.9%) and Grade 9 (43.5%) in the same year. Nevertheless, we found more inferential and evaluative level tasks in the Grade 3 test compared to the tests for Grades 6 and 9 (59.1% and 9.1% in Grade 3, 52.4% and 4.8% in Grade 6 and 52.2% and 4.3% in Grade 9, respectively).

The 2014 tests did not consider the students' cognitive ability either. Literal level tasks were found less often in the tests for Grades 3 and 9 (63.6% and 64.0%, respectively), whereas the Grade 6 test included 76.0% of these tasks. The distribution of inferential level tasks was higher in the tests for Grades 6 and 9 compared to the Grade 3 test (24.0% in Grades 6 and 9 and 18.2% in Grade 3). However, the Grade 3 test was distinctive with the highest proportion of evaluative level tasks (18.0%). The Grade 9 test included 12.0% of this kind of task, whereas no evaluative level tasks were in the Grade 6 test.

The 2015 tests differed from another years. In accordance with the students' cognitive development, the most literal level tasks were found in the Grade 3 test (66.7%) and the least in the Grade 9 test (45.0%). Also, in the tests for Grades 6 and 9, greater emphasis was on the inferential level tasks (42.9% and 35.0%, respectively) compared to the test for Grade 3 (27.8%). However, there were no evaluative level tasks in the Grade 6 test although these tasks were included in the tests for Grades 3 and 9 (5.6% and 20%, respectively).

The year of 2016 was exceptional because we had to exclude the Grade 6 test due to its different test taking format. In comparison with the tests for Grades 3 and 9, consideration of students' cognitive development was not revealed. The Grade 3 test included slightly more literal level tasks and fewer inferential level tasks than the Grade 9 test (respectively, 56.3% and 52.6% literal level tasks and 37.5% and 47.4% inferential level tasks). However, the Grade 3 test contained 6.3% evaluative level tasks, while none were in the Grade 9 test.

4. Discussion and recommendations

In text comprehension assessments, it is important to consider the complex nature of comprehension and students' developmental growth. Tests for the same age group should include tasks that measure skills at literal, inferential and evaluative comprehension levels in a similar

proportion. This allows tracking of students' change in comprehension and comparison of the results of students from the same grade in different years. This information allows teachers to analyse how different students have accomplished the curricular requirements in comprehension and enables them to plan the language lessons. In this study, we found that national Estonian-language tests assess skills at different text comprehension levels randomly. The analysis also revealed that there was a change in the distribution of tasks at comprehension levels among different grades, which in most cases was not in accordance with students' developmental growth.

We compared the similarity of the structure of distribution of tasks at literal, inferential and evaluative comprehension levels between the tests for the same grade in different years. We found that there was no consistency in assessing students' comprehension skills in the national Estonian-language tests. For example, the main emphasis in the 2014 Grade 6 test was on literal level tasks, whereas evaluative level tasks were not included at all. However, the 2013 Grade 6 test focused mostly on inferential level tasks and included evaluative level tasks as well. Variability in the tasks' comprehension levels in the tests for the same grades may be caused by the fact that there appears to be no framework for measuring text comprehension in the Estonian language (see Karbla et al., 2018), as there is for compiling PISA tests (OECD, 2008). A framework would allow the formation of national tests that continuously measure students' comprehension skills at different levels with age-appropriate tasks. These tests would also guide teachers on how to promote comprehension skills (Vestheim & Lyngsnes, 2016). Additionally, the lack of similarities in the tests carried out in the same grade does not allow any comparison of the results year by year. This comparison is essential for teachers to design their teaching as well as to make relevant inferences about students' development through the years. Also, educational politicians need the comparison to make decisions.

Next, we analysed to what extent the distribution of comprehension levels changed among the tests for different grades. In most cases, the tests for younger students included more inferential and evaluative level tasks than the tests for older students. Only the tests in 2015 for Grades 3 and 9 considered the students' cognitive growth: the Grade 3 included more literal and fewer evaluative level tasks than the Grade 9 test. Comparing the tests from other years revealed that the greatest number of tasks at evaluative level were in the tests for Grade 3. Furthermore, the tests for Grade 6 in years 2014 and 2015 and for Grade 9 in 2016 did not include evaluative level tasks at all. This result is not in concordance with previous studies, which have indicated that younger students' text comprehension is more related to the literal level and linguistic components (Cain et al., 2004; Oakhill et al., 2015). On the other hand, older students' comprehension is more dependent on pre-knowledge, cognitive processes and metalevel skills at inferential and evaluative levels (Kibui, 2012). Therefore, the tests for older students should include fewer literal and more inferential and evaluative level tasks compared to the tests for younger students. The reason why analysed tests in our study did not consider students' cognitive growth may be that science-based principles are not used for compiling the tests in Estonia. A cooperative working team would help to devise tests that include tasks at different comprehension levels that account for students' development.

National tests have a great impact on what and how teachers include material in the teaching process (Vestheim & Lyngsnes, 2016). In this study, the analysed tests included few inferential and evaluative level tasks, especially in Grades 6 and 9. Regarding these tests, the students can be considered as proficient readers based on how well they understand literal information. Although it is important to comprehend texts at a literal level (Kibui, 2012), it does not ensure deep understanding of texts. Furthermore, low attention on analytical and critical thinking tasks in national tests may leave behind the promotion of inferential and evaluative level skills in the classroom (Karbla, Uibu & Mannamaa, 2017; Vestheim & Lyngsnes, 2016). The result might be that students view reading as a mechanical, insignificant and boring assignment rather than a possibility to discuss the ideas in the text or expand their knowledge and skills (Applegate et al., 2002). Thus, the national tests should be based on scientific works that highlight the complex nature of comprehension and students' development in it, giving teachers direction for which comprehension skills and in what amount should be promoted in language lessons for various age groups.

Based on this study, several implications are described and recommendations made to improve students' text comprehension skills:

1. To evaluate students' versatile competency in text comprehension and its deficits, more balanced tests that consider the complex nature of comprehension as well as students' cognitive development should be developed. Although it is important to improve comprehension skills at every level in all age groups, the emphasis in tests should move from literal in younger age groups to inferential and evaluative tasks in older age groups. Hence, the compilers who compose tests for different grades should cooperate to ensure developmentally sensitive assessments.
2. As text comprehension is an essential skill in school, it is worthwhile considering compiling separate tests for measuring students' improvement in it. Single-purpose comprehension tests would allow a more precise overview of students' comprehension skills at different levels.
3. National tests are important indicators that allow assessment of students' accomplishments as well as deficits. Therefore, it is essential to consider the improvement of existing measurement tools (not only in Estonia). Clearer principles in national tests would allow teachers to adopt methods that would improve students' text comprehension skills. Therefore, a framework for assessing students' text comprehension should be developed.

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