The role of metacognitive reading strategies in children’s scores on history and geography: effects and non-effects of reading strategies, school grade and language background

Master’s Thesis

Gaby Verhoeven
S4471989

First reader: dr. Jetske Klatter-Folmer
Second reader: dr. Gerrit Jan Kootstra

Radboud University, Nijmegen
2019 – 2020
Table of Contents

Abstract ........................................................................................................................................... 1

Chapter 1: An introduction to reading comprehension, metacognition, and reading strategies ......... 2
  1.1 Metacognition and reading comprehension ........................................................................... 3
  1.2 The effects of reading strategies on reading comprehension ................................................ 4
  1.3 The effects of reading comprehension skills on other school domains ............................... 6
    1.3.1 The effects of reading comprehension skills on mathematics .................................... 7
  1.4 Summary of previous studies ............................................................................................... 10
  1.5 Present study ...................................................................................................................... 11
    1.5.1 Nederlands Linguïstisch Instituut ............................................................................... 11
    1.5.2 The metacognitive reading strategies in 'Grip op Tekst' .............................................. 14

Chapter 2: Methodology .............................................................................................................. 16
  2.1 Study 1: Comparing children’s language scores ................................................................. 16
    2.1.1 Participants .................................................................................................................. 16
    2.1.2 Language task ............................................................................................................ 17
    2.1.3 Procedure .................................................................................................................. 17
    2.1.4 Data analysis .............................................................................................................. 18
  2.2 Study 2: Comparing children’s scores on history and geography ........................................ 18
    2.2.1 Participants ................................................................................................................ 18
    2.2.2 History and geography task ...................................................................................... 20
    2.2.3 Procedure ................................................................................................................ 23
    2.2.4 Data analysis .............................................................................................................. 24

Chapter 3: Results ....................................................................................................................... 25
  3.1 Study 1: Comparing children’s language scores ................................................................. 25
    3.1.1 Comparing children’s language scores on the entry test and the final test ................ 25
  3.2 Study 2: Comparing children’s scores on history and geography ........................................ 27
    3.2.1 Descriptive statistics regarding children’s background information ......................... 28
    3.2.2 Comparing language scores of GoT children ............................................................ 28
    3.2.3 Comparing children’s scores on history and geography ............................................ 30
  3.3 Summary of results .......................................................................................................... 32
    3.3.1 Study 1 ..................................................................................................................... 32
    3.3.2 Study 2 ..................................................................................................................... 32

Chapter 4: Discussion ................................................................................................................. 34
  4.1 Discussion study 1 .............................................................................................................. 34
    4.1.1 Related background variables in study 1 .................................................................. 35
  4.2 Discussion study 2 .............................................................................................................. 35
Abstract

Previous studies have shown that reading comprehension is a difficult and demanding task for children, and that providing instruction in reading comprehension can be a complex task for teachers (e.g. Massey & Heafner, 2004; Moje, Young, Readence, & Moore, 2000; Stoeldraijer & Vernooy, 2011). Moreover, reading comprehension skills seem to affect scores on mathematics and societal studies, because these school domains are often presented in a verbal format (e.g. Bauman & Serra, 1984; Carpenter et al., 1980). Instruction in how to use metacognitive reading strategies seems to positively affect scores on reading comprehension tests (e.g. Greenleaf, Jiménez & Roller, 2002; Tregaskes & Daines, 1989). The present study aimed to gain more insight into the effects of metacognitive reading strategies on the verbal school domains history and geography. As a first step in investigating this question, study 1 focused on children who completed a course in language and reading comprehension that also focuses extensively on metacognitive reading strategies. The data were analyzed using a series of mixed ANOVAs. The results showed that children obtained higher scores in reading comprehension, spelling, and grammar after completion of the course. The reversed effect was found for vocabulary. Then, study 2 made the connection with children’s scores on history and geography. Participants were divided into an experimental group with children who followed the language course, and a control group with children who followed a mathematical course that does not focus on the metacognitive reading strategies. The data were analyzed using a series of three-way factorial ANOVAs. The results showed that children who followed the mathematical course scored significantly higher than the children who followed the language course on the total score of the test and on the total score of the non-linguistic questions. There were no significant differences found between the two groups on the score of the linguistic questions. Besides this result, the monolingual children significantly outperformed the multilingual children regarding their total score on this history and geography test. These findings contribute to the understanding of effects of reading comprehension and reading strategies on other school domains and may therefore have implications for schools, test constructors, and programs that focus on reading comprehension and other verbal school domains.
Chapter 1: An introduction to reading comprehension, metacognition, and reading strategies

Reading is defined as a cognitive process in which an interaction occurs between the reader, the text, and the author’s perspectives (Zhussupova & Kazbekova, 2016). Reading comprehension is the underlying process that makes this interaction happen. Therefore, reading comprehension is a highly demanding aspect of reading, because it is the understanding, and moreover, the interpretation of what the reader has read. Reading comprehension demands readers to store the information in the text that has recently been decoded. Readers also have to use complex processes of constructing the meaning of the text to derive an integrated representation of the full text (García-Madruga et al., 2013). Thus, reading comprehension is a cognitive task that simultaneously implies the processes of extracting meaning and constructing meaning during reading (Snow & Sweet, 2003).

As reading is such a difficult and demanding task, instruction in reading comprehension does not always lead to satisfactory results (e.g. Massey & Heafner, 2004; Moje, Young, Readence & Moore, 2000). For example, 25% of Dutch primary school children leave school as weak readers (Stoeldraijer & Vernooy, 2011). It is difficult for these children to overcome that problem during high school or during the rest of their societal life. This problem might in part be caused by the instruction of reading comprehension that the children receive during primary school. Teachers might have trouble in helping children to develop reading comprehension skills, which may lead to instruction that is not effective enough.

For example, the RAND Reading Study Group (2002) stated in its book Reading for Understanding that it is the core challenge in the field of research in reading comprehension to help researchers, teachers, and policymakers understand that instruction in reading comprehension is the first step in children’s development in proficient reading. Only a few good readers will make progress by using their own strategies and techniques, but most children will not. These children need “explicit, well-designed instruction in reading comprehension to continue to make progress” (RAND Reading Study Group, 2002, p. 2).

However, the authors of Reading for Understanding also state that an adequately rich set of theories and models regarding reading comprehension instruction is absent. Therefore, it is hard for teachers to gather specific information about how to help in their students’ situations, for example about why students do not understand history texts or why students do not seem to learn or acquire enough information from reading texts.
The authors also mention another factor that seems to play a role in students’ lack in reading comprehension skills. This factor is that classroom materials often seem to be too difficult to comprehend or seem to be not interesting enough. This might result in students who cannot understand the texts or are not motivated enough to read them. Therefore, it is unsurprising that the overall view seems to be that many children are able to read technically, but are unable to comprehend the words, sentences, and structures that they have read (Pressley & Block, 2002).

However, there seems to be one clear answer for teachers concerning instruction about reading comprehension: teach children how to use metacognitive reading strategies (e.g. García-Madruga et al., 2013; Tregaskes & Daines, 1989; Zhussupova & Kazebekova, 2015). These metacognitive reading strategies help children in efficiently reading and understanding texts, as will be explained in the following two sections.

1.1 Metacognition and reading comprehension

Metacognition is the thinking of an individual about its own thinking and this is considered the foundation for reading comprehension strategies (Zhussupova & Kazebekova, 2016). This means that proficient readers who are aware of metacognition, constantly “monitor their own thoughts, control their experience with the text and enhance their understanding” (Zhussupova & Kazebekova, 2016, p. 594). Metacognition is therefore an essential device in reading comprehension (e.g. Brown, 1980; Cornoldi, 1990; Ryan, 1981). There are several ways in which metacognition is involved in reading and Garner (1987) summarized this into the following nine points:

‘Reading requires readers to:
1. Understand that reading means not simply decoding, but also extracting meaning;
2. Recognize the relative importance of different information included in a passage;
3. React to noncongruent information;
4. Approach texts differentially, depending on task requirements;
5. Rate the relative difficulty and comprehensibility of different parts of the text, and consequently pay differential attention to these parts;
6. Recognize differences in reading ability between themselves and others;
7. Recognize that by making predictions, or by other active processes, they may enhance their comprehension of the text;
8. Understand differences between texts and differences within a text (e.g. role of the title, bold face), and draw necessary conclusions;

Taken all these steps into account, it can be concluded that it is complex to learn to read comprehensively using metacognition (García-Madurga et al., 2013). That is the reason why these steps have been worked out into more concrete reading strategies which can support readers to read texts more efficiently.

1.2 The effects of reading strategies on reading comprehension

During the last decade, the importance of reading comprehension skills has become clearer. This means that teachers have started to pay more attention to reading strategies that support students in reading texts more efficiently. This realization was based on the renewed interest in earlier work by Ryan (1981). The aim of the research of Ryan (1981) was to investigate the difference in reading skills between students who learnt reading strategies in class and students who had to learn these strategies themselves. The results indicated that the self-taught strategies of the students were significantly less adequate than the reading strategies that were taught by teachers. This caused a significant difference in the students’ reading skills, because the students who learnt strategies in class scored significantly higher on a reading test than the students who did not learn these strategies in class. After this research by Ryan (1981), a rising number of studies has started to focus on the effects of reading strategies on reading comprehension skills.

For example, Tregaskes and Daines (1989) investigated whether metacognitive reading strategies have positive effects on reading comprehension skills among upper elementary aged students. Tregaskes and Daines (1989) investigated 152 lower-middle-class students from sixth-grade classes in an elementary school in the United States. They randomly divided these students into an experimental group and a control group. The experimental group received instruction in the metacognitive strategies over a period of 12 weeks, whereas the control group did not receive any instruction of these strategies at all.

The five metacognitive strategies the students were taught in the study of Tregaskes and Daines (1989) were visual imagery, summary sentences, webbing (making a graphic representation of the relationships in a text), self-interrogation about the students’ prior knowledge, and “click cards”, which is a system that helps students to check their own understanding. A cloze test and an error detection test were administered as pre-tests and post-
tests to measure the students’ improvement in reading comprehension. The results showed a significant difference on both tests between the experimental group and the control group, which means that the experimental group showed a significantly higher increase regarding reading comprehension skills than the control group. This significant difference was found by using the cloze test ($p < .01$), and by using the error detection test ($p < .01$). This indicates that teaching metacognitive reading strategies is an efficient way for students to improve their reading comprehension skills.

This indication was also found in the study of Zhussupova and Kazbekova (2016), who investigated whether the implementation of metacognitive reading strategies positively affected reading comprehension. Participants were 60 Kazakhstani university students who were learning English as a foreign language. These participants were randomly divided into a control group and an experimental group. The study lasted 4 months and students received lessons of 3 hours a week. However, only the experimental group received lessons in metacognition in which they focused on the following reading strategies: promoting self-questioning, thinking aloud while performing a task, and making use of graphic representations.

After the 4 months, the results displayed that the experimental group showed a greater improvement in their level of English reading comprehension than the control group. The results of the control group in the post-test remained at the same level as the pre-test (namely 52% correct), whereas the results of the experimental group went from 52% correct in the pre-test to 84% correct in the post-test. Furthermore, the experimental group showed higher scores on their level of metacognition than the control group. For example, 44% of the students in the experimental group achieved excellent metacognition comprehension compared to only 26% of the students in the control group. Thus, this study of Zhussupova and Kazebekova (2016) also showed that metacognitive reading strategies seem to contribute to the improvement of reading comprehension and to the improvement of level of metacognition.

Finally, García-Madruga et al. (2013) found similar results in their experiments. The aim of their study was to train normally developing students regarding metacognitive reading strategies to improve their abilities in reading comprehension. In their first experiment, the researchers evaluated reading comprehension, whilst controlling for participants’ working memory and general intelligence. Participants ($N=35$) were primary school students, who were divided into an experimental group that received instructions in reading strategies, and a control group that did not receive these instructions. Both groups participated in a pre-test and a post-test to evaluate their reading comprehension skills by measuring four components: knowledge access, text memory, making inferences, and integrating prior knowledge.
The results showed that there was a significantly higher pre-test to post-test gain in reading comprehension in the experimental group in comparison to the control group. This effect was between medium (Cohen’s $d = .67$) and large (Cohen’s $d = .86$) sized. The researchers implicated that this gain was affected by the training program, and that it was not affected by participants’ general intelligence or working memory. Then, they conducted a second experiment to overcome the limitation of their first experiment of having a reduced number of participants. The same procedure was used as in the first experiment, but they tested 46 participants instead of 35 participants.

The results of the second experiment again indicated that there were reliable increases after the training program in the experimental group. Especially, the gain in reading comprehension of the low skilled group was significant and this effect was large ($p < .001$, Cohen’s $d = 1.34$). Thus, this research of García-Madruga et al. (2013) also showed that training programs in reading comprehension are an efficient tool to improve reading comprehension, especially for low skilled readers.

In summary: taken these aforementioned studies into account, it can be concluded that metacognitive reading strategies seem to positively contribute to the development of reading comprehension. This is the case for different types of language users. For example, in the studies of García-Madruga et al. (2013) and Tregaskes and Daines (1989), the focus was on children at primary school, whereas Zhussupova and Kazbekova (2016) focused on university students that learnt English as a foreign language, and Ryan (1981) focused on students’ reading comprehension skills in their native language. All studies showed the positive effects of the reading strategies on reading comprehension skills.

1.3 The effects of reading comprehension skills on other school domains
Reading comprehension skills do not only affect scores on reading comprehension tests in participants’ native language or foreign language, but it is suggested that these reading skills may also be of use in other school domains. This is reflected in several studies that showed that reading comprehension skills are also necessary in these other school domains.

For example, Baumann and Serra (1984) aimed to determine the frequency and placement of main ideas by introducing a new topic in one sentence at the beginning of a paragraph. Their aim was to provide more insight into this phenomenon whilst using materials that are only intended for children at primary schools. Baumann and Serra (1984) used the following definition of a “main idea”:
The main idea of a paragraph signals to the reader the most important statement the writer has presented to explain the topic. […] This statement characterizes the major idea to which the majority of sentences refer. This statement is usually developed in a single sentence. (p. 29)

To investigate their research question, Baumann and Serra (1984) looked into the frequency and placement of these main ideas in 100 passages for fourth-, sixth-, and eighth-grade children. The passages were derived from social studies texts, and focused on different school topics, such as regional geography, the contemporary world, and the historical world.

The results showed that only 27% of all these 100 social studies texts opened a new paragraph with an explicit main idea sentence. For the remainder of the texts, 6% contained delayed-completion main ideas, and 67% contained inferred main ideas. These results indicate that children who read these textbooks will need to have reading comprehension skills to identify the main idea themselves. Baumann and Serra (1984) suggest that children who have not (yet) developed these reading comprehension skills are more likely to drop out on these texts than children who do have access to these skills. This could mean that teaching children reading strategies might help them in better understanding texts concerning other school domains than language and reading classes, that also demand reading comprehension skills.

1.3.1 The effects of reading comprehension skills on mathematics

Although the study of Baumann and Serra (1984) focused on social studies texts, the majority of previous studies has focused on the effects of reading comprehension skills on mathematical tests (e.g. Abedi & Lord, 2001; Carpenter, Corbitt, Kepner, Linquist & Reys, 1980; Haag, Heppt, Roppelt & Stanat, 2014; Hickendorff & Janssen, 2009). The overall result of these studies is that a discrepancy was found between a verbal format in mathematical tests and a numeric format in mathematical tests, and that this discrepancy also affected the participants’ scores on these two different tests (e.g. Carpenter et al., 1980; Cummins, Kintsch, Reusser & Weimer, 1988).

Firstly, Cummins et al. (1988) explained that most mathematical tests are actually word problems, because they require “skillful mapping of text input onto the reader’s knowledge base if proper comprehension is to be achieved. […] In the case of word problems, the solver must map linguistic input onto knowledge about the problem domain” (p. 406). Carpenter et al. (1980) even concluded that children perform 10% to 30% worse on mathematical exercises in a word format compared to mathematical exercises in a numeric format. Thus, Carpenter et al.
(1980) suggested that linguistic skills might contribute to a larger degree to successfully solving these problems than mathematical skills.

These findings were also proved in other studies. For example, Abedi and Lord (2001) investigated the importance of language on students’ preferences and performances regarding mathematical word problems. They compared these aspects between students who were English language learners (ELLs) and students who were proficient speakers of English. Abedi and Lord (2001) also investigated whether there was an effect of modifying the linguistic structures in these mathematical items on the test performance of the students. The corpus of math items consisted of 69 items that were derived from a widely used mathematical test. This corpus was judged by experts, who were asked to identify linguistic features in these items that might be problematic for ELL students. After this identification had occurred, the items that were regarded as (too) difficult were simplified by keeping the math task the same, but by erasing complex linguistic structures and complex vocabulary.

In their first experiment, Abedi and Lord (2001) conducted a students’ perceptual study in which they asked the students (N = 19) to make comparisons between the original items and the simplified items regarding difficulty, comprehensibility, and preference. The results showed that the preference for the simplified version was significantly greater (p < .05) than the preference for the original version. The students’ judgements showed that this preference was mostly due to the finding that the simplified versions were easier to read, were shorter, gave a clearer idea of what to do, and contained more familiar vocabulary.

The second experiment in the study of Abedi and Lord (2001) was conducted to determine whether the significant differences in preferences were also reflected in actual scores on the mathematical test items. In a selection of 20 items, both original items and simplified items were presented to students (N = 1174) in a pen-and-paper format. Students showed variation in language backgrounds, socioeconomic status, and ethnic background. Firstly, the results showed that the proficient English speakers scored substantially higher on the math items than the ELL students. Secondly, the results showed that the overall scores on the simplified mathematical items were significantly higher (p < .01) than the scores on the original mathematical items. Therefore, Abedi and Lord (2001) suggested that linguistic skills might be of greater contribution in solving mathematical items than mathematical skills.

The aim in the study of Haag et al. (2014) was also to investigate the effects of simplifying mathematical items regarding linguistic features on test results. More specifically, Haag et al. (2014) wanted to test whether this simplification of items would lead to a smaller performance gap between language minority students and German monolingual students. In
doing so, they created linguistically simplified versions of 23 of the “linguistically most challenging mathematic test items used in the German National Assessment Study” (p. 150). The aspects that were often simplified or erased were long words, unfamiliar vocabulary, passive constructions, and sentence length. The study used data from 17,738 students, aged 10;3 years, who completed a mathematical test that contained both original items and linguistically simplified items.

The analyses of Haag et al. (2014) showed that the language minority students performed significantly lower ($p < .05$) on all items than the German monolingual students. However, the results did not show an overall effect of the linguistic simplification on the scores of the language minority students. These effects were visible when interaction effects of language proficiency were entered. This means that the language minority students with intermediate language proficiency could profit significantly more ($p < 0.01$) from the linguistic simplification than the German monolinguals. Thus, the differences in scores on mathematical tests might not be due to complex linguistic structures but rather to a more general problem of language minority students to read texts.

Finally, Hickendorff and Janssen (2009) investigated the difference between mathematical items in word format versus mathematical items in numeric format on the results of primary school children in the Netherlands. The participating primary school children differed in age, home language, and scores on reading comprehension. The used materials in this study were derived from Cito, an organization that creates the most important tests that are used as national tools in the Netherlands. The mathematical tests of Cito contain a linguistic format.

The children participated in a standardized mathematical test and a constructed test that only contained mathematical items in a numeric format. Firstly, the results showed that the two different tasks were seen as two different constructs, meaning that there was a high and significant correlation between the performances on both tests ($p < .001$), but the analyses also showed that the percentage of explained variance was high, namely between 70% and 80%. This suggests that the tests require students to make use of different sorts of skills. Therefore, reading comprehension skills might be of greater contribution to solving the items in the linguistic format than mathematical skills.

Secondly, the results showed that monolingual Dutch children scored higher on the items in linguistic format than on the items in numeric format. These scores were significant for all age groups. This was in contrast to the children with another home language than Dutch, because they scored significantly higher on the items in numeric format than on the items in
linguistic format, again concerning all age groups. The same pattern was visible in the correlation between children’s scores on reading comprehension and children’s scores on the two mathematical tests. This means that children with higher scores on reading comprehension scored significantly higher on the items in linguistic format, whereas children with lower scores on reading comprehension scored significantly higher on the items in numeric format.

Moreover, the results showed that the Dutch monolingual children scored in general significantly higher than children with another home language. However, this gap was significantly smaller between the items in numeric format than between the items in linguistic format. Thus, all studies mentioned above indicate that reading comprehension skills are also needed in other school domains, for example in societal studies texts (Baumann & Serra, 1984), but also in mathematical tests (e.g. Haag et al., 2014; Hickendorff & Janssen, 2009).

1.4 Summary of previous studies

Based on the studies mentioned in the previous sections, it can be concluded that scores on reading comprehension seem to be affected by metacognition and by reading strategies. It has been showed in these studies that students who had received instruction in how to use metacognitive reading strategies performed significantly better on reading comprehension tests than students who had not received instruction in how to use these strategies. However, participants were mostly students on high schools or universities, and not many studies have focused on students on primary schools. Also, multiple studies made a distinction between monolinguals and language learners of a specific language, whereas it is also interesting to see what happens if all participants are proficient language users of a specific language.

Furthermore, previous studies have shown that linguistic skills are also needed in other school domains. For example, Baumann and Serra (1984) showed that many texts in social studies for children do not start with a sentence that introduces the topic of the paragraph. This could mean that children with lower scores on reading comprehension are more likely to drop out on these texts than children with higher scores on reading comprehension. However, the majority of these studies has focused on the effects of linguistic skills on mathematical tests (e.g. Abedi & Lord, 2001; Haag et al. 2014; Hickendorff & Janssen, 2009).

The focus was mostly not on other school domains, such as geography or history, even though these domains probably demand children to use reading comprehension skills as well, because of their verbal format (RAND Reading Study Group, 2002). For example, the RAND Reading Study Group (2002) stated that instruction in reading comprehension is rarely integrated within content-area instruction, even though instruction in these domains relies
strongly on texts as a major source of the content. These texts and their belonging instruction from teachers are not used as a tool for instruction in reading comprehension, whilst that skill is needed to understand the texts and to learn the content of the texts. This last aspect has not been thoroughly researched yet.

1.5 Present study

The present study aims to investigate the effects of teaching children metacognitive reading strategies on their scores on two other mandatory school domains, namely history and geography. These school domains demand children to use their skills in reading comprehension (Rand Reading Study Group, 2002). The main research question of the present study is:

To what extent does teaching primary school children different types of metacognitive reading strategies affect their scores in other school domains that require reading comprehension skills?

The data collection took place at the Nederlands Linguïstisch Instituut (Institute for Dutch Linguistics), which offers language and comprehension courses in an out-of-school environment.

The present study was conducted not to confirm or disconfirm earlier findings, but rather to contribute to the continuous process of understanding the underlying aspects of reading comprehension, and the relevance of teaching children metacognitive reading strategies. The results might provide additional insight into the effects or non-effects of metacognitive reading strategies on the development of primary school children’s reading comprehension and their skills on other verbal school domains.

1.5.1 Nederlands Linguïstisch Instituut

As was mentioned before, the data collection took place at the Nederlands Linguïstisch Instituut (NLI), which is a private institute that offers primary school children courses in language and reading comprehension in an out-of-school environment. The course is called ‘Grip op Tekst’ (Grip on Text) and its program consists of 14 lessons. The course has three aims: (1) provide the children with a solid language base in Dutch, (2) teach the children metacognitive reading strategies that lead to better reading comprehension skills, and (3) make
children aware of the importance and the fun of reading books. Thus, the course consists of three major domains.

The first major domain consists of lessons in three basic principles of Dutch: vocabulary, spelling, and grammar. These three basic principles help the children to obtain a high level in the Dutch language, that might eventually facilitate their skills in reading comprehension. Firstly, the children have to learn vocabulary on Digiwak, which is an online tool that provides vocabulary lists (www.digiwak.nl). The children have to acquire many words via this tool, because it is assumed that there is a minimum percentage of words that needs to be understood in a text to fully understand it. For example, a minimum of 95% – 98% is needed for comprehension of non-literary texts (Nation & Hu, 2000; Nation, 2006).

The vocabulary lists of Digiwak were developed by researchers of the University of Amsterdam (Kuiken & Droge, 2010), and it was commissioned by the Dutch Ministry of Education, Culture, and Science. The lists are used as a guideline for teachers at primary schools. The Digiwak has 36 themes (e.g. sports, nature, animals, food and drinks, study and work) and all words belong to one of these themes and to children’s school grade in which the words are ought to be taught. Digiwak offers children words with their respective meanings, but it also offers pictures, and examples of sentences that provide the children with the contexts of the words.

These different ways of presenting the words positively affect the speed of the children’s acquisition of these new words (Kuiken & Droge, 2010; Van den Nulft & Verhallen, 2009). This ensures that the children will be presented with these words in many different contexts and this decision is based on studies that have suggested that a word that needs to be learnt, has to be presented 5 to 10 times for it to be fully acquired (e.g. Gu, 2003; Nation, 1990; Rott, 1999). Moreover, every lesson in the workbook of ‘Grip op Tekst’ focuses on one or two of themes that are also used in Digiwak. The words the children have to learn on Digiwak are presented multiple times throughout the exercises and texts in the children’s workbook of the course.

The children also have to learn spelling in the first major domain. The spelling domain consists of the following lessons throughout the course: dividing words into syllables, composing plural nouns, composing compounds and derivations, and the spelling of verbs. Finally, the children have to learn grammar in the first major domain. This consists of the following areas: recognizing/naming word types, sentence analysis, and writing sentences with correct punctuation. The effect of teaching children these aspects throughout the first major domain (vocabulary, spelling and grammar) is that they will not have to struggle with these
linguistic structures while reading a text. As a result, they “only” have to focus on comprehending the meaning of the whole text.

The second major domain is teaching children metacognitive reading strategies. At the beginning of the course, all children receive a small card with reading strategies and they learn that they always have to read a text in the same way by following the steps on this card (see Appendix 1). The children learn how to use these strategies in different types of texts, such as (news) articles, poems, letters, reviews, fragments from books, and informational texts.

The aim of using this card is that the children will get familiar with metacognitive reading strategies and that they will be able to use these strategies automatically at the end of the course. This procedure is, for example, based on the research of Fisher, Frey and Lapp (2008), who introduced the idea of “shared reading” (p. 548). The idea of this phenomenon is that the teacher and the students share a text, for example by students reading a text while the teacher reads aloud or by discussing the text by thinking aloud. This process of shared reading is the point of focus during every lesson of the course. The different reading strategies that are presented during the course by following the steps on the card (Appendix 1) are explained in section 1.5.2.

The last aim of the course is to make children aware of the fun of reading books and the importance of reading books, because reading books leads to implicit acquisition of all language aspects such as vocabulary, reading comprehension, grammar and spelling (e.g. Ponniyah & Venkatesan, 2018). At first, children receive a book that is chosen by the teachers of ‘Grip op Tekst’. During the present study, this book was the Dutch version of Ronia, the Robber’s Daughter, written by Astrid Lindgren (1982). The children have to read minimally 15 minutes a day and they have to summarize the book by creating a mind map. Creating a mind map is an effective way in keeping up with important aspects concerning the main character of the book (e.g. Edwards & Cooper, 2010; Mento, Martinelli, & Jones, 1999). An example of a mind map (based on Roald Dahl’s The BFG) that is made by one of the children during the course is presented in Figure 1.

When children have finished reading Ronia, the Robber’s Daughter, they have to choose a new book themselves. This new book is often chosen in consultation with the teacher, who is mostly able to advise a nice book for every individual child. This can, for example, be related to the study of Mckool and Gespass (2009), who suggested that “teachers have the greatest opportunity to influence (our) children’s reading habits” (p. 264). The teacher’s aim is
to help find a book that suits the child, which hopefully increases his motivation in reading the book. Once the new book has been chosen, the children again have to create a mind map and they have to present this mind map and the book to the teacher and the other students in lesson 8 of the course. The aim is that the children have read approximately 3 or 4 books at the end of the course.

Figure 1. Child’s mind map (in Dutch) created for Roald Dahl’s The BFG.

1.5.2 The metacognitive reading strategies in ‘Grip op Tekst’

The metacognitive reading strategies that children learn during the course and that are the focus of the present study are explained by making use of the course’s card presented in Appendix 1. The metacognitive reading strategies that are used can be related to several studies that suggested that these strategies positively affect scores on reading comprehension (e.g. Fisher et al., 2008; Hattie, 2009; Vernooy, 2007). The first reading strategy the children have to use when reading a text is predicting. This means that the children have to predict the topic of the text by making use of the following elements in a text: the title, the images, the subheadings, and the source. In doing so, the children learn that they are able to extract a lot of information about the text without reading it in detail.

The second reading strategy is activating prior knowledge. Children already have a general idea of the topic of the text because of the first step, which was predicting. They now have to consider if they already know something about the topic of the text, for example based on school lessons, other texts, or their own interests. This second strategy is partly based on the studies of Langer (1984) and Gaultney (1995). These studies showed that this pre-reading
activity activates prior knowledge, and that this seems to improve performance on (difficult) reading comprehension questions. After the children have completed these first two strategies, they have to read the text. This is also explained in the third step of the card: reading.

After the reading has been completed, the fourth step is visualizing. The children have to visualize the text, which means that they have to make an image in their head about what the topic could look like in real life. Children often get the chance to share this with the rest of the group during the lesson. The fifth step is asking questions, in which the children can think about what else they would like to know about the topic after the text has been read. They can also ask questions about unfamiliar words.

During this reading strategy of asking questions, the teacher also gets the opportunity to explain what children can do once they struggle with an unfamiliar word in the text. For example, they learn about the strategy to predict the word’s meaning by placing it into the context of the full sentence. Another strategy that can be used is trying to divide the complex word into parts that are familiar to the children. For example, the Dutch language consists of many compounds (e.g. Neijt & Schreuder, 2007) and the meaning of these compounds can often be found by trying to extract the meaning of a smaller part of the compound (an example is the Dutch compound huizenrij, which consists of the words ‘houses’ and ‘row’ and it literally means ‘row of houses’).

The last step is summarizing. The children have to answer the WH-questions related to the text’s topic: Who, What, When, Where, Why, and HoW. After answering these questions, they have to make a summary by using the answers to these questions. In doing so, children learn how to search for the most important aspects of information in the text. Finally, after completing these six steps, the children can start by answering the questions concerning the text.
Chapter 2: Methodology

This chapter provides an overview of the methodology of the present study. It consists of the methodology of the two studies that were conducted to answer the research question. The first study compared the language scores of children who had followed the course ‘Grip op Tekst’ (GoT children). The second study compared the scores on the history and geography test between the GoT children and the children who had followed a mathematical course ‘Foutloos Rekenen’ (FR children). This second study was conducted to investigate if instruction in metacognitive reading strategies positively affected children’s scores on history and geography. For both studies, this chapter provides information on the following sections: the participants, the task, the procedure, and the data analysis.

2.1 Study 1: Comparing children’s language scores

As a first step in answering the research question, all available scores on the language test of the GoT children who completed the course between September 2019 and January 2020 were compared. The aim of study 1 was to gather information on whether the children had obtained better skills in the Dutch language regarding reading comprehension, spelling, grammar, and vocabulary. Data of the children that participated in study 1 were derived from data that were collected by the teachers of the course ‘Grip op Tekst’. These data are used during the course to provide the teachers with insight in whether the children had improved their skills after completion of the course.

2.2.1 Participants

Participants were 57 GoT children who completed the course. This means that they at least have had the 14 lessons in total as described in section 1.5.1. There were 30 boys and 27 girls. Furthermore, at the time of testing 11 children were in grade 6, 22 children were in grade 7, and 24 children were in grade 8. All tested children lived in the Netherlands in environments with Dutch as the dominant language, at least outside of home.

Data of an additional group of 32 children were also available. However, these 32 children were still following the course at the time of testing, which means that they had only taken the entry test of the course. Therefore, these children were not included in the analyses, because their scores would distort the view on the comparisons between the entry test and the final test.
2.1.2 Language task
At the start of the course, children have to take the entry test. The teachers use this test to provide themselves with a baseline of the children’s skills. All components that will be taught during the course are already included in this entry test. Those are the following components: reading comprehension, spelling, grammar, and vocabulary. In the part regarding reading comprehension, the children have to read a text and answer questions concerning that text. This part mostly shows if children are able to understand what kind of text they have read, and if they know how to use the text to provide themselves with the right answers on the questions.

The spelling part consists of the following aspects: dividing words into syllables, composing plural nouns, composing compounds and derivations, and the spelling of verbs. The grammar part consists of naming word types, sentence analysis, and writing sentences with correct punctuation and capital letters. Finally, children have to answer ten questions about vocabulary. These ten words are derived from the Digiwak, and the questions are for example about synonyms or about the right definitions of the words. Once the children had taken this entry test, the teachers of ‘Grip op Tekst’ can indicate what the gaps are in the skills per individual child. Then, it can be decided what the learning objectives are per child at the start of the course.

Once the children completed 13 lessons of the course, the children are asked to take the final test in lesson 14. This test consists of the same aspects as the entry test, but the questions are a bit different so the chances of a learning effect are small. Comparing the children’s test scores between the entry test and the final test can show the children’s development, and the tests can therefore be used as a tool to decide whether the child has benefited from the course or not. For the present study, the scores on these two tests were used to indicate the kind of progress the children made during the course and mostly if they had obtained a higher score in reading comprehension which might be due to the instruction of the metacognitive reading strategies. The entry test of the course can be found in Appendix 2. As stated before, these aspects are also used in the final test with minimum differences in the questions.

2.1.3 Procedure
The children took both tests during a regular lesson. This means that they took the test in a group with four to six children, and that their own teacher was present while they took the test. The children could ask questions during the test, but the teacher was not allowed to answer a question if it provided the child with the right answer to the question of the test. Data of the children’s scores on both tests were already available, because the teachers of ‘Grip op Tekst’
use them in order to gain insight in the children’s development. Therefore, these data could be obtained from the course’s administration.

2.1.4 Data analysis
Prior to any analyses to answer the question whether the metacognitive reading strategies affects children’s skills on the different language components and especially on reading comprehension, the data were checked for several assumptions, which were the levels of the variables, outliers, normality, homogeneity, and independence (Field, 2013). Based on these outcomes, a few datapoints were excluded.

In order to determine if the metacognitive reading strategies resulted in higher scores on the different language components, a series of 2x3 mixed ANOVAs was conducted. This type of analysis was used, because the data consisted of two independent variables, namely test moment and school grade. The variable test moment was measured within subjects (entry test versus final test), whereas the variable school grade was measured between subjects (grade 6, grade 7, or grade 8). Therefore, a mixed ANOVA design was needed to conduct the analyses (Field, 2013). The dependent variables were the children’s scores on the different language components (total score, reading comprehension, spelling, grammar, and vocabulary).

2.2 Study 2: Comparing children’s scores on history and geography
After the children’s scores on the tests of ‘Grip op Tekst’ were analyzed to investigate the children’s development regarding the different language components, a connection was made with the children’s scores on history and geography. Study 2 might give insight in whether reading comprehension skills and the instruction in the metacognitive reading strategies might positively affect the children’s scores on history and geography.

2.2.1 Participants
Participants were 61 children aged between 10 to 12 years. The experimental group consisted of 30 GoT children. The control group consisted of 31 FR children. The course ‘Foutloos Rekenen’ is provided by the same institute, but it focuses on mathematics instead of language and reading comprehension. Therefore, the FR children had not received the instruction in the metacognitive reading strategies. The GoT children in this study were partly the same children as in study 1. It was not possible to fully conduct study 2 with the same children as in study 1,
because data of study 2 had to be collected, whilst data of study 1 were already present in the course’s administration.

The FR children were chosen to be the control group, because it was expected that the general learning motivation of these FR children would be comparable with the general learning motivation of GoT children. It was assumed that this comparable amount of motivation that is needed to follow either ‘Grip op Tekst’ or ‘Foutloos Rekenen’ in an out-of-school environment would reduce differences on the reading comprehension scores between these two groups because of motivation (e.g. Wigfield, Gladstond & Turci, 2016). An additional 2 children were also tested, but they were not included in the analyses, because they were not able to complete the history and geography test in the intended way.

All tested children lived in the Netherlands in environments with Dutch as the dominant language at least outside of the home. However, many children had language backgrounds in which other languages were spoken at home. Language backgrounds of the children’s home languages (HL) are presented in Table 1. This table shows that of the 61 children, only 21 children were monolingual Dutch children. There was one child who grew up in a home environment without Dutch, where only Russian was spoken. The other 40 children grew up in bilingual or even trilingual home environments with Dutch as one of their home languages.
Table 1

Frequency table of children’s home languages (HL’s)

<table>
<thead>
<tr>
<th>HL1</th>
<th>Frequency</th>
<th>HL2</th>
<th>Frequency</th>
<th>HL3</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dutch</td>
<td>60</td>
<td>Arabic</td>
<td>11</td>
<td>Arabic</td>
<td>2</td>
</tr>
<tr>
<td>Russian</td>
<td>1</td>
<td>Berber</td>
<td>1</td>
<td>Gerber</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bosnian</td>
<td>1</td>
<td>English</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chinese</td>
<td>1</td>
<td>Croatian</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>German</td>
<td>2</td>
<td>Turkish</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>English</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>French</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hindu</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kurdish</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moroccan</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pakistani</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Spanish</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Surinamese</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Turkish</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>61</td>
<td>Total</td>
<td>39</td>
<td>Total</td>
<td>10</td>
</tr>
</tbody>
</table>

2.2.2 History and geography task

Prior to the test regarding the school domains history and geography, the participants were asked to answer questions that provided information about their background. They were asked to answer questions regarding their age, gender, which course they followed (‘Foutloos Rekenen’ or ‘Grip op Tekst’), how many languages they speak at home, and what these languages are. In order to test if teaching children metacognitive reading strategies affects their scores on other school domains, a test in geography and history was constructed.

This test is the Dutch final test of primary education and it was obtained by Cito. This is a Dutch organization that creates the most used tests in the Netherlands commissioned by the Ministry of Education, Culture, and Science. It is a Dutch achievement test and it is administered at the end of primary school, when children are approximately 12 years old. The tests for primary schools are used as a tool to help teachers in deciding what type of school fits best to the children after primary school (Hickendorff & Janssen, 2009). One of the tests that schools can buy from Cito, is the test ‘Wereldoriëntatie’ (World Orientation), which consists of the following school domains: geography, history, and biology/technique. For the present
study, an old version of this test was used. This old version was used from 2016 to 2018 and it consisted of 90 questions, divided over the aforementioned school domains (College voor Toetsen en Examens, 2016).

The test in the present study consisted of 20 questions concerning geography and history. These domains were chosen, because it was found in the original version of Cito that these questions contained more linguistic elements than the questions concerning biology/technique. Eventually, the test consisted of 10 questions concerning geography, and 10 questions concerning history. Moreover, a distinction was made between questions that contained many linguistic elements and questions that did not contain many linguistic elements. This selection was based on the judgements of two experimenters that fully agreed (100%).

For example, in the linguistic questions children first had to read a short story before answering the question, or the answers contained long sentences with linguistic structures or complex vocabulary. The item in Figure 2 was judged as being a linguistic question, because children had to read a short story as part of the question, and also because the answers are presented in a verbal format. In the non-linguistic questions, children only had to read the question itself to answer it. Also, the answers do not contain linguistically complex structures with long sentences or difficult words. The item in Figure 3 example was judged as being a non-linguistic question. The order of these 20 questions was randomized to reduce changes of order effects. Also, there were two versions of the test (version A and version B), based on reverse counterbalancing, to reduce effects of fatigue. Version A of the test can be found in Appendix 3.
### Opgave 13

**Handel**

In de tijd van ontdekkers en hervormers (1500-1600) groeiden de Nederlanden uit tot een belangrijk Europees handelscentrum. Hout en graan uit landen rondom de Oostzee en zout en wijn uit Spanje en Frankrijk werden naar Nederlandse havens gebracht. Hier werden ze dan weer door Nederlandse handelaren doorverkocht.

Waarom werden juist de Nederlandse havens uitgekozen?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>De heerser van de Nederlanden uit die tijd was ook koning van Spanje en keizer van het Heilige Roomse rijk. Daarom was hij zeer geliefd en dreef iedereen graag handel met de Nederlanden.</td>
</tr>
<tr>
<td>B</td>
<td>De Nederlanden hadden in die tijd te maken met overbevolking. Daarom konden de buitenlandse handelaren hun handelswaar hier gemakkelijk kwijt.</td>
</tr>
<tr>
<td>C</td>
<td>De Nederlanden lagen tussen het zuiden en de Oostzee in. Als de handelaren hun spullen hier verkochten, hoefden ze nooit heel lange reizen te maken.</td>
</tr>
<tr>
<td>D</td>
<td>De Nederlanden waren destijds het Europese centrum van de schilderkunst. Veel buitenlandse handelaren kwamen hier om musea te bezoeken. De Nederlandse handelaren maakten van die situatie gebruik door met deze mensen te handelen.</td>
</tr>
</tbody>
</table>

*Figure 2. Example of a linguistic question. Reprinted from “Opgavenboekje Wereldoriëntatie 2016 – 2018”, by College voor Toetsen en Examens, 2016, p. 17.*
2.2.3 Procedure

The children were tested on different days, because they could participate in this test before or after their regular lesson of ‘Foutloos Rekenen’ or ‘Grip op Tekst’. The children’s parents were already informed about the day of testing, and about the general aim of the experiment. This means that children could just walk into the testing room if their parent(s) had granted permission. This resulted in mostly small groups of children that were tested simultaneously, because they came in at the same time before or after their class.

Firstly, a short instruction about the aim of the study was given. The children were told that they could not fail the test, because it had nothing to do with their personal school situation nor with the course they followed at the institute. Also, children were told that the test would approximately take 20 to 25 minutes, that they had to read all questions and answers thoroughly, and that they had to start with the questions concerning background information.

The first child that came in to take the test had to make version A of the test, the second child had to take version B of the test, and so on. Whilst the children took the test, they were allowed to ask the experimenter questions. However, questions concerning vocabulary or concrete information on the topic were not answered by the experimenter. In those cases, the
children were told that they had to choose the answer that fit best or that they could skip the question if they really did not know the answer. The experimenter gave the children a sticker sheet after the test to reward them for their collaboration.

2.2.4 Data analysis

As a first step in investigating whether the metacognitive reading strategies affected children’s scores on geography and history, the scores of the entry test and the final test of the GoT children were compared. This analysis was conducted to measure if the GoT children in study 2 showed the same patterns as the GoT children in study 1. Therefore, the same data analyses were conducted in study 2 as in study 1, using mixed ANOVAs. However, the children in study 2 were grade 7 or grade 8 students, not grade 6 students. This means that study 2 consisted of a series of 2x2 mixed ANOVAs instead of 2x3 mixed ANOVAs.

The second step was to analyze the children’s scores on the history and geography test. Prior to the analyses, the data were again checked for several assumptions, which were outliers, normality, homogeneity, and independence (Field, 2013). Based on these outcomes, a few datapoints were excluded from the data set prior to the analyses. Then, a series of three-way factorial ANOVAs was conducted. There were three categorical independent variables, namely course (‘Grip op Tekst’ versus ‘Foutloos Rekenen’), school grade (grade 7 versus grade 8), and language background (monolingual children versus multilingual children). The differences between these independent variables were compared for three dependent variables: the total number of correct answers on the history and geography test, the number of correct answers on the linguistic questions, and the number of correct answers on the non-linguistic questions.
Chapter 3: Results

The central aim of the present study was to determine if teaching children metacognitive reading strategies affects their scores on geography and history questions. In doing so, a distinction has been made between children who had received instruction in these metacognitive reading strategies in an out-of-school environment (GoT children), and children who did not have this instruction (FR children). However, as a first step in investigating this question, a series of 2x3 mixed ANOVAs was conducted in study 1 to investigate the development of GoT children concerning different language tasks (reading comprehension, spelling, grammar, and vocabulary). The second step is related to the children’s scores on geography and history as conducted by a series of three-way factorial ANOVAs in study 2. This chapter presents the data of both studies.

3.1 Study 1: Comparing children’s language scores

The first study was conducted to investigate the development of the GoT children concerning different language tasks. A total score on the test was derived from the following language tasks: reading comprehension, spelling, grammar, and vocabulary. This section presents the data of the descriptive statistics and a series of 2x3 mixed ANOVAs.

3.1.1 Comparing children’s language scores on the entry test and the final test

In study 1, the scores on the entry test and the final test of 57 GoT children were compared. A series of 2x3 mixed ANOVAs was conducted to compare the different scores on the language components (total score, reading comprehension score, spelling score, grammar score, and vocabulary score) between the moment of testing (the entry test versus the final test), and between the children’s school grade (grade 6, grade 7, and grade 8). These scores are presented in Table 2.
Table 2
Means and standard deviations of children’s scores on the different language tasks on the entry test and the final test of the course ‘Grip op Tekst’

<table>
<thead>
<tr>
<th>Test</th>
<th>Grade</th>
<th>Language scores M (SD)</th>
<th>Total</th>
<th>Reading comprehension</th>
<th>Spelling</th>
<th>Grammar</th>
<th>Vocabulary</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entry test</td>
<td>6</td>
<td>35.80 (10.58)</td>
<td>36.40 (11.08)</td>
<td>40.50 (2.26)</td>
<td>24.82 (15.52)</td>
<td>36.36 (23.36)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>52.21 (13.84)</td>
<td>55.55 (20.30)</td>
<td>60.35 (16.42)</td>
<td>39.32 (19.66)</td>
<td>58.64 (16.99)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>58.54 (9.35)</td>
<td>62.52 (16.12)</td>
<td>63.71 (10.12)</td>
<td>52.85 (20.41)</td>
<td>60.69 (23.44)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>52.32 (13.92)</td>
<td>55.49 (19.25)</td>
<td>59.89 (14.13)</td>
<td>42.58 (21.73)</td>
<td>55.65 (22.88)</td>
<td></td>
</tr>
<tr>
<td>Final test</td>
<td>6</td>
<td>59.60 (7.93)</td>
<td>61.00 (13.05)</td>
<td>62.50 (10.33)</td>
<td>58.00 (13.78)</td>
<td>38.18 (13.28)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>66.59 (12.07)</td>
<td>71.59 (10.41)</td>
<td>77.75 (8.74)</td>
<td>73.36 (12.93)</td>
<td>38.64 (20.83)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>76.07 (8.10)</td>
<td>79.22 (10.90)</td>
<td>82.39 (10.22)</td>
<td>84.41 (7.77)</td>
<td>48.28 (21.10)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>69.75 (11.49)</td>
<td>73.29 (12.74)</td>
<td>78.46 (11.31)</td>
<td>75.52 (14.61)</td>
<td>43.07 (20.15)</td>
<td></td>
</tr>
</tbody>
</table>

The first mixed ANOVA compared the total score of the tests between the different groups. A main large effect of test moment was found, which showed that the mean scores on the entry test were significantly lower than the scores on the final test ($F(1, 56) = 170.93, p < .001, \eta^2 = .753$). Also, there was a significant main effect of school grade on the total score. Comparisons using Bonferroni revealed that children in grade 8 ($M = 67.31, SD = 1.80$) scored significantly higher ($p < .001$) than children in grade 6 ($M = 47.70, SD = 2.97$). They also significantly outperformed ($p < .05$) the children in grade 7 ($M = 59.40, SD = 2.00$). Children in grade 7 scored significantly higher ($p < .01$) than children in grade 6. There were no interaction effects found between test moment and school grade.

However, the different language components weighted differently on the total score: reading comprehension, spelling, and grammar all accounted for 30% of the total score, whereas vocabulary accounted for 10% of the total score. Therefore, it is also of importance to discover if there were any differences in scores per language component. Another 2x3 mixed ANOVA was conducted for reading comprehension. There was a large main effect of test moment on the reading comprehension scores ($F(1, 56) = 54.87, p < .001, \eta^2 = .495$). This means that the children scored significantly higher on the final test than on the entry test. Comparisons using Bonferroni revealed that children in grade 8 ($M = 70.87, SD = 2.17$) significantly outperformed ($p < .001$) the children in grade 6 ($M = 48.70, SD = 3.56$). Children in grade 7 ($M = 63.57, SD = 2.40$) also scored significantly higher ($p < .01$) than children in grade 6. No interaction effects were found between test moment and school grade.
The third 2x3 mixed ANOVA was conducted for the spelling component. Once again, there was a large main effect of test moment that showed that the scores on the final test were significantly higher than the scores on the entry test ($F(1, 56) = 76.29, p < .001, \eta^2_p = .599$). Comparisons using Games-Howell (since Levene’s test was significant for spelling scores on the entry test) revealed that both children in grade 8 ($M = 73.05, SD = 1.70$) and children in grade 7 ($M = 69.05, SD = 3.67$) scored significantly higher on spelling ($p < .001$) than children in grade 6 ($M = 51.50, SD = 3.67$). No interaction effects were found between test moment and school grade.

Then, a 2x3 mixed ANOVA was conducted for the grammar component. A large main effect of test moment was found on the grammar scores, and it showed that the grammar scores on the final test were significantly higher than the scores on the entry test ($F(1, 56) = 147.23, p < .001, \eta^2_p = .726$). Comparisons using Games-Howell (Levene’s test was significant for the final test) showed several significant differences. Firstly, the children in grade 8 ($M = 68.96, SD = 2.41$) significantly outperformed ($p < .01$) the children in grade 7 ($M = 56.34, SD = 2.62$) and they significantly outperformed ($p < .001$) the children in grade 6 ($M = 41.41, SD = 3.70$). Children in grade 7 also scored significantly higher ($p < .01$) than children in grade 6. No interaction effects were found.

For vocabulary, the 2x3 mixed ANOVA showed a medium main effect of test moment on vocabulary. However, this effect was reversed. It was shown that the mean score on the final test was significantly lower than the mean score on the entry test ($F(1, 56) = 8.70, p < .01, \eta^2_p = .129$). Comparisons using Bonferroni revealed that children in grade 8 ($M = 54.84, SD = 3.04$) scored significantly higher ($p < .05$) than children in grade 6 ($M = 37.72, SD = 4.94$). No interaction effects were found between test moment and school grade.

3.2 Study 2: Comparing children’s scores on history and geography

Study 1 showed that the language course positively affected children’s scores of reading comprehension, spelling, and grammar. The reversed effect was found for vocabulary. Study 2 was conducted to investigate if children also obtained higher scores on history and geography because of the instruction in metacognitive reading strategies they had received. The school domains history and geography are often presented in a verbal, linguistic format (e.g. Rand Reading Study Group, 2002). In doing so, the scores of GoT children were compared with the scores of FR children. This section presents the scores on the entry test and final test of the GoT children in study 2, and a series of three-way factorial ANOVAs to compare the scores of the GoT children and the scores of the FR children on the history and geography questions.
3.2.1 Descriptive statistics regarding children’s background information

There were 61 children who participated in study 2. The division regarding gender, course, grade, and language background is presented in Table 3. The data of the independent variable language background had been divided into two groups, namely monolinguals and multilinguals. There were only several children who spoke three or more languages at home. They were added to the group of bilinguals, because then the sample sizes of the groups (monolinguals versus multilinguals) regarding this variable were more equal (Field, 2013).

This decision is also supported by research that determined that bilinguals and multilinguals differed significantly from monolinguals on different language tasks, but that there are often no differences found between bilinguals and multilinguals (e.g. Poarch & Bialystok, 2015; Schroeder & Marian, 2016; Temblay & Sabourin, 2012).

Table 3
Children’s background information regarding course, gender, school grade, and language background in frequencies

<table>
<thead>
<tr>
<th>Course</th>
<th>Gender</th>
<th>School grade</th>
<th>Language background</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys</td>
<td>Girls</td>
<td>Grade 7</td>
</tr>
<tr>
<td>Grip op Tekst (N = 30)</td>
<td>16</td>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td>Foutloos Rekenen (N = 31)</td>
<td>13</td>
<td>18</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td>32</td>
<td>27</td>
</tr>
</tbody>
</table>

\(^a\)Data of 1 child were missing.

3.2.2 Comparing language scores of GoT children

These first analyses were conducted to examine if the GoT children who participated in study 2 showed the same patterns as the GoT children who participated in study 1. This was a first step in investigating what the effects were of the instruction in metacognitive reading strategies concerning this experimental group of study 2. The sample size was quite small (N = 21), because several GoT children still followed the course at the time of testing. It was impossible to compare their results, because they had not taken the final test yet. There were 10 children who were in grade 7 at the time of testing, and 11 children who were in grade 8. There were 11 boys and 10 girls. The scores of these children are presented in Table 4.
Table 4

Means and standard deviations of children’s scores on the different language tasks on the entry test and the final test of the course ‘Grip op Tekst’

<table>
<thead>
<tr>
<th>Grade</th>
<th>Language scores M (SD)</th>
<th>Total</th>
<th>Reading comprehension</th>
<th>Spelling</th>
<th>Grammar</th>
<th>Vocabulary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entry test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>46.40 (16.45)</td>
<td>45.00 (7.35)</td>
<td>55.20 (13.26)</td>
<td>27.60 (21.23)</td>
<td>57.00 (20.03)</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>66.32 (4.68)</td>
<td>61.18 (9.21)</td>
<td>69.09 (11.60)</td>
<td>61.73 (11.73)</td>
<td>67.27 (25.73)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>56.83 (15.38)</td>
<td>53.48 (11.63)</td>
<td>62.48 (14.03)</td>
<td>45.48 (24.01)</td>
<td>62.38 (23.22)</td>
<td></td>
</tr>
<tr>
<td>Final test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>63.70 (14.74)</td>
<td>74.50 (8.59)</td>
<td>67.00 (12.88)</td>
<td>69.60 (18.83)</td>
<td>32.50 (16.20)</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>79.91 (6.47)</td>
<td>81.64 (10.38)</td>
<td>86.64 (6.04)</td>
<td>86.10 (7.22)</td>
<td>58.18 (10.79)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>72.19 (13.70)</td>
<td>78.24 (10.10)</td>
<td>77.29 (13.92)</td>
<td>78.24 (16.03)</td>
<td>45.95 (18.68)</td>
<td></td>
</tr>
</tbody>
</table>

Again, the total scores of the GoT children were compared as a first step. A large main effect of test moment on the total score was found, that showed that the scores on the final test were significantly higher than the scores on the entry test \( (F(1,1) = 52.60, p < .001, \eta_p^2 = .735) \). Comparisons using Bonferroni showed that the children in grade 8 \( (M = 73.11, SD = 3.14) \) scored significantly higher \( (p < .01) \) than the children in grade 7 \( (M = 55.05, SD = 3.30) \). No interaction effects were found between test moment and school grade.

Secondly, the scores on reading comprehension were compared using a 2x2 mixed ANOVA. Again, a large main effect of test moment was found that showed that the scores on the final test were significantly higher than the scores on the entry test \( (F(1, 1) = 83.93, p < .001, \eta_p^2 = .815) \). Comparisons using Bonferroni showed that the children in grade 8 \( (M = 71.41, SD = 1.95) \) significantly outperformed \( (p < .01) \) the children in grade 7 \( (M = 59.75, SD = 2.05) \). No interaction effects were found.

There was also a large main effect found of test moment on the scores of spelling, which showed that the scores on the final test were significantly higher than the scores on the entry test \( (F(1, 1) = 31.30, p < .001, \eta_p^2 = .622) \). Comparisons using Bonferroni showed that the children in grade 8 \( (M = 77.87, SD = 2.86) \) performed significantly better \( (p < .01) \) than children in grade 7 \( (M = 61.10, SD = 3.00) \). No interaction effects were found.

The following results were found for the grammar component. Firstly, a large main effect of test moment was found on the grammar scores. This means that the children scored better on the final test than on the entry test \( (F(1, 1) = 115.09, p < .001, \eta_p^2 = .885) \). Secondly, there was a significant interaction effect \( (p < .01, \eta_p^2 = .300) \) between test moment and school grade. This effect indicates that the growth in grammar differed between grade 7 and grade 8.

To break down this interaction, contrasts compared the grammar scores across grade 7 and
grade 8. These comparisons using Bonferroni revealed that scores in both grades increased over test moment. However, this increase was higher for children in grade 7. Finally, it was shown that children in grade 8 ($M = 73.91$, $SD = 4.16$) scored significantly higher ($p < .001$) than children in grade 7 ($M = 48.60$, $SD = 4.37$).

Finally, the results were compared on the vocabulary component. A large main effect of test moment was found on the scores of vocabulary, again in the opposite direction. This means that the children scored significantly higher on the entry test than on the final test ($F(1, 1) = 12.46$, $p < .001$, $\eta^2_p = .396$). Comparisons using Bonferroni revealed that children in grade 8 ($M = 62.73$, $SD = 4.70$) scored significantly higher ($p < .05$) than children in grade 7 ($M = 44.75$, $SD = 4.93$). No interaction effects were found between test moment and school grade.

In summary, these results indicate that the GoT children who participated in study 2 showed the same patterns as the GoT children who participated in study 1. This can be concluded from the overall view that the scores on the final test were significantly higher than the scores on the entry test for the total score, reading comprehension, spelling, and grammar. The reversed pattern was found for the vocabulary scores, meaning that the scores on the final test were significantly lower than the scores on the entry test. Moreover, the same pattern was found for study 1 and study 2 when the between-groups were compared. This means that the children in higher grade often scored significantly higher than the children in lower grades.

### 3.2.3 Comparing children’s scores on history and geography

The children’s scores on the history and geography test are presented in Table 5. There are three dependent variables: the total number of correct answers, the number of correct answers on the linguistic questions, and the number of correct answers on the non-linguistic questions. Moreover, the scores per independent variable (course, school grade, and language background) are presented in this table.

As was explained in chapter 2, the children had to answer 20 questions in total. These questions were divided into 10 linguistic questions and 10 non-linguistic questions. Thus, these were the maximum scores the children could achieve. Table 5 shows that the scores on these three different domains do not complement each other. This is due to the fact that a few scores had to be removed from the data, because they violated assumptions.
Table 5

Children’s scores on the history and geography test divided into a total score, a linguistic score and a non-linguistic score

<table>
<thead>
<tr>
<th>Course</th>
<th>Total score</th>
<th>Linguistic score</th>
<th>Non-linguistic score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grip op Tekst</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>6.89 (0.49)</td>
<td>3.60 (0.33)</td>
<td>3.27 (0.29)</td>
</tr>
<tr>
<td>Grade 7</td>
<td>5.33 (1.92)</td>
<td>3.33 (1.07)</td>
<td>2.17 (0.94)</td>
</tr>
<tr>
<td>Grade 8</td>
<td>7.89 (2.95)</td>
<td>3.78 (1.96)</td>
<td>4.11 (1.75)</td>
</tr>
<tr>
<td>Monolinguals</td>
<td>7.64 (2.84)</td>
<td>3.82 (1.60)</td>
<td>3.82 (2.09)</td>
</tr>
<tr>
<td>Multilinguals</td>
<td>6.42 (2.84)</td>
<td>3.47 (1.71)</td>
<td>3.05 (1.51)</td>
</tr>
<tr>
<td>Foutloos Rekenen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>8.85 (0.51)</td>
<td>3.96 (0.33)</td>
<td>4.74 (0.30)</td>
</tr>
<tr>
<td>Grade 7</td>
<td>8.07 (2.37)</td>
<td>3.47 (1.51)</td>
<td>4.40 (1.64)</td>
</tr>
<tr>
<td>Grade 8</td>
<td>9.13 (2.77)</td>
<td>4.13 (1.89)</td>
<td>5.00 (1.46)</td>
</tr>
<tr>
<td>Monolinguals</td>
<td>8.57 (2.52)</td>
<td>4.45 (1.81)</td>
<td>4.73 (1.10)</td>
</tr>
<tr>
<td>Multilinguals</td>
<td>7.26 (2.94)</td>
<td>3.42 (1.58)</td>
<td>4.68 (1.80)</td>
</tr>
</tbody>
</table>

The first three-way factorial ANOVA was conducted to compare the different scores on the total number of correct answers. The first significant main effect that was found showed a medium effect of course on the total number of scores (F(1, 58) = 8.37, p < .01, ηp² = .141). This means that the FR children obtained a significantly higher score than the GoT children.

Moreover, a medium main effect of school grade was found (F(1, 58) = 8.03, p < .01, ηp² = .136). This means that, in both groups based on course, the children in grade 8 scored significantly higher than the children in grade 7. Finally, a medium main effect of language background was found on the total score (F(1, 58) = 4.85, p < .05, ηp² = .091). This effect showed that the monolingual children scored significantly better on the test than the multilingual children. No interaction effects were found between the independent variables.

Two three-way factorial ANOVAs were conducted to investigate if there were any differences in the scores on history and geography when linguistic complexity was taken into account. Firstly, this analysis was done by comparing the scores of the linguistic questions. No significant main effects were found and no significant interaction effects were found. Only a trend was found of language background on the linguistic questions (F(1, 58), = 3.07, p = .08, ηp² = .056). This trend showed that the monolinguals scored better regarding the linguistic questions than the multilinguals. However, this trend did not reach significance.
The last three-way factorial ANOVA was conducted to compare the scores on the non-linguistic questions. A medium main effect of course was found on the non-linguistic score \( (F(1, 58) = 12.42, p < .01, \eta_p^2 = .193) \). This effect showed that the FR children scored significantly higher than the GoT children. There was also a medium main effect of school grade on the non-linguistic score \( (F(1, 58) = 11.29, p < .01, \eta_p^2 = .178) \). This effect showed that the children in grade 8 scored significantly higher on the non-linguistic questions than the children in grade 7. No interaction effects were found between the independent variables.

### 3.3 Summary of results

#### 3.3.1 Study 1

In study 1, a series of 2x3 mixed ANOVAs was conducted to investigate if GoT children would obtain higher scores regarding their language skills in reading comprehension, spelling, grammar, and vocabulary after they completed the language course with its metacognitive reading strategies. The scores on these language components were the dependent variables. The independent variables were test moment and school grade. The mixed ANOVAs that were conducted to compare the total scores, and the scores on reading comprehension, spelling, and grammar all showed similar effects. For all these language components, it was shown that the mean scores on the entry test were significantly lower than the scores on the final test. Also, children in higher grade mostly outperformed children in lower grades.

The last mixed ANOVA was conducted to compare the scores on vocabulary. These effects were different than the aforementioned effects. The ANOVA again showed a main effect of test moment. However, this effect was in the opposite direction, because the scores on the final test were significantly lower than the scores on the entry test. Comparisons did show the same pattern regarding children’s school grade, because children in grade 8 scored significantly higher than children in grade 6.

#### 3.3.2 Study 2

Study 2 was conducted to investigate if metacognitive reading strategies affected children’s scores on history and geography. Those school domains are often presented in a verbal format (e.g. Rand Reading Study Group, 2002). As a first step in investigating this question, the same analyses as in study 1 were conducted for the GoT children in this data set of study 2. A series of 2x2 mixed ANOVAs was conducted. These ANOVAs showed that the same patterns were found as in study 1.
Firstly, this means that the scores on the entry test regarding the total score, reading comprehension, spelling, and grammar were significantly lower than the scores on the final test. However, it was shown again that the scores on vocabulary on the entry test were significantly higher than the scores on the final test. Secondly, children in higher grades often scored significantly better than children in lower grades. In contrast to study 1, one significant interaction effect was found, namely for the grammar component. This interaction effect showed that the increase in grammar skills for children in grade 7 is higher than the increase for children in grade 8. In summary: the same general patterns were found for the GoT children in study 2 as were found for the GoT children in study 1.

Then, the link was made with the scores on history and geography of all children. There were three dependent variables: the total number of correct answers, the number of correct answers on the linguistic questions, and the number of correct answers on the non-linguistic questions. The independent variables were course, school grade, and language background. A series of three-way factorial ANOVAs was conducted to compare these scores.

For the total number of correct answers, a significant effect was found for course. FR children scored significantly higher than GoT children. Moreover, the children in grade 8 scored higher than the children in grade 7 in both these groups. Finally, the monolingual children in both groups scored higher than the multilingual children.

Then, the scores on the linguistic questions were compared. No significant effects were found. The last ANOVA compared the scores on the non-linguistic questions. The FR children scored significantly higher than the GoT children. Finally, the children in grade 8 scored significantly higher than the children in grade 7. This was the case in both groups.
Chapter 4: Discussion

This chapter discusses the results that were found in the two studies and that were presented in chapter 3. Moreover, possible explanations for these results are provided in this chapter.

4.1 Discussion study 1

The first study was conducted to investigate if GoT children would obtain higher scores regarding their language skills in reading comprehension, spelling, grammar, and vocabulary after completing the course ‘Grip op Tekst’, with its metacognitive reading strategies. The scores were compared within the moment of testing (entry test versus final test) and between children’s school grade (grade 6, grade 7 or grade 8). These scores were compared by conducting a series of 2x3 mixed ANOVAs.

The first mixed ANOVAs partly confirmed the first expectation, namely that the children’s language scores would increase. These effects were found for the total score and for the scores on reading comprehension, spelling, and grammar. This is in line with results of many other previous research, that also showed positive effects of instruction in metacognitive reading strategies on reading comprehension skills (e.g. García-Madruga et al., 2013; Tregaskes & Daines, 1989; Zhussupova & Kazbekova, 2015). However, this means that it cannot be determined if instruction in metacognitive reading strategies positively affected the scores on spelling and grammar or if it is the fact that the children also received extra instruction in these domains during the course.

In contrary, the expectation was not confirmed for the children’s scores on vocabulary, because the scores on the entry test were significantly higher than the scores on the final test. This could be explained by the finding that the word assignments on the entry test seemed to be slightly easier to answer than the word assignments on the final test. However, the present study only investigated the first test results of the GoT children. In the NLI program, children get a second chance, if they have not showed enough improvement on a specific language component. The teacher will spend some time with the individual child to discuss the results of the first test and to give some extra tips or exercises on how to practice for the second chance. Thus, this often happens for the vocabulary component after the first test. The untabulated data of these second chances on vocabulary do show a gain on final test in comparison to the entry test.

Moreover, these results of the second chance could indicate that children might need more time to acquire the explicit definitions of the words on Digiwak for the vocabulary
component. This would also be in line with studies that were mentioned in section 1.5, that showed that a word that needs to be learnt, has to be presented 5 to 10 times for it to be fully acquired (e.g. Gu, 2003; Nation, 1990; Rott, 1999). It is advised for future research to take this into account when exploring the data of the children.

The second expectation was fully confirmed in study 1. This means that the GoT children in higher grades significantly outperformed the children in lower grades. It was found for almost all language components that the children in grade 8 scored higher than children in grade 6 and in grade 7. Children in grade 7 also scored higher than children in grade 6. In summary: all findings of the present study suggest that children who were taught metacognitive reading strategies show the intended increase for reading comprehension. As was mentioned before, it cannot be determined if these reading strategies also caused the increase of the spelling component and the grammar component.

4.1.1 Related background variables in study 1

As was discussed before, the expectations were confirmed in study 1, except for the vocabulary component. Despite that, there are a few factors that could have led to a more detailed insight in the children’s language scores of study 1. The first background variable that could have given more insight, but that was not included in the analyses, is the language background of the children. As will be discussed later, language background of the children in study 2 showed significant differences in scores. Thus, the results of study 1 would be more comparable with the results of study 2 if language background was accounted for.

Another useful addition to study 1 would have been the scores on either the entry test or the final test of the control group, thus the FR children. Then, a comparison could have been made on the language scores between the experimental group and the control group, before comparing their scores on the history and geography test. This would have led to more detailed comparisons between the two groups of study 2. Therefore, it is recommended for future research to take these background variables into account when comparing children’s language scores, and children’s scores on history and geography.

4.2 Discussion study 2

The main aim of study 2 was to compare children’s scores on the history and geography test to investigate if instruction in metacognitive reading strategies would affect the children’s scores
on these verbal school domains. As a first step in doing so, the same analyses as in study 1 were conducted to compare the language scores of the GoT children that participated in study 2. The same patterns were found as in study 1 for test moment and school grade. This means that the scores on the final test for reading comprehension, spelling, and grammar were higher than the scores on the entry test. The reversed pattern was again found for the vocabulary component. Secondly, the children in higher grades scored better on the language components than the children in lower grades. This suggests that the children that participated in study 2 (N = 21) showed the same development during the course ‘Grip op Tekst’ as the children that participated in study 1 (N = 57).

One significant interaction effect was found in study 2, that was not found in study 1. This interaction displayed that the children in grade 7 showed a higher increase in the grammar component than the children in grade 8. This effect can be explained by the fact that most schools in the Netherlands do not teach all aspects of grammar in grade 7 yet (e.g. Meijerink et al., 2008). However, the children learn these grammar aspects during the course ‘Grip op Tekst’. Therefore, it can be expected that children in grade 7 show a high increase, because the course ‘Grip op Tekst’ provides them with instruction in these grammar aspects for the first time, whereas children in grade 8 might have already learnt these aspects at primary school and will therefore probably show a lower increase.

The second step in study 2 was to make the connection with the children’s scores on history and geography. This was investigated by conducting a series of three-way factorial ANOVAs to compare the children’s scores regarding the course they followed (‘Foutloos Rekenen’ versus ‘Grip op Tekst’), their language background (monolinguals versus multilinguals), and their school grade (grade 7 versus grade 8).

The first effects showed that FR children scored significantly higher than GoT children regarding the total number of correct answers on the test, and the correct answers on the non-linguistic questions. There were no differences found between these two groups regarding the correct answers on the linguistic questions. Thus, the expectations were not confirmed, because it was expected that the GoT children would score significantly better than the FR children. This expectation was based on the literature presented in section 1.2, that showed that children who were instructed in how to use metacognitive reading strategies scored better on reading comprehension skills than children who were not instructed in how to use these strategies (e.g. García-Madruga et al., 2013; Tregaskes & Daines, 1989; Zhussupova & Kazbekova, 2016). It was expected that the instruction in those reading strategies would also affect children’s scores
on history and geography, because these school domains are considered to contain a linguistic format as well (e.g. Baumann & Serra, 1984; Rand Reading Study Group, 2002).

Although the expectations were not confirmed, the results do indicate that a change might take place concerning the GoT children. This can be explained by the finding that there are no significant differences between FR children and GoT children when the scores on the linguistic questions were compared. This means that there are differences between the other two dependent variables, which indicates that the GoT children might generally score lower than the FR children. However, this null finding could indicate that instruction in metacognitive reading strategies does affect children’s scores on the linguistic questions.

This means that the GoT children might have used the reading strategies to some extent, but only when they were aware of the fact that they had to read a question in a verbal format in order to provide an answer. Thus, metacognitive reading strategies might affect children’s scores when children know they have to use their reading comprehension skills. This possible explanation has to be treated with caution, because the results of both groups show a generally low score. The maximum score the children could achieve was 10, but the mean score for the FR group was 3.96, and the mean score for the GoT group was 3.60. This could indicate that these linguistic questions are generally more difficult, which would be in line with previous studies that found that children performed worse on questions in a verbal format than on questions in a non-verbal format (e.g. Abedi & Lord, 2001; Carpenter et al., 1980; Haag et al., 2014). Moreover, children might not comprehend that they can also apply the reading strategies during tests on other school domains than reading comprehension.

In order to obtain a more detailed insight in what happens when children have to answer linguistically complex questions for school domains as history and geography, it is recommended for future research to conduct a similar study as the present study, but to conduct this with more participants, and with more questions on the history and geography domains to provide a greater statistical power of the sample (Field, 2013). As was mentioned before, it is also recommended to collect the scores on reading comprehension of the control group to make more detailed comparisons between the two groups of children.

Even though the expectation regarding instruction of metacognitive reading strategies, i.e. the course of the children (‘Grip op Tekst’ versus ‘Foutloos Rekenen’) was not confirmed, the expectation regarding children’s language background was confirmed (e.g. Haag et al., 2014; Hickendorff & Janssen, 2009). This means that the monolingual children scored higher on the history and geography test than the multilingual children. This difference was significant for
the total number of right answers, and there was a trend for the linguistic questions. Due to the significant difference regarding the total number of questions, it can be concluded that multilingual children seem to have more trouble with this history and geography test than monolingual children. This is also in line with the finding of Uiterwijk and Vallen (2005), who aimed to “provide test constructors with information which is as detailed as possible about sources of DIF (Differential Item Functioning) in order to help them avoid item bias in future forms of the test” (p. 211). Uiterwijk and Vallen (2005) concentrated on the classification of linguistic sources in a test constructed by Cito, and, moreover, they investigated if these linguistic sources facilitated or impeded the scores of the immigrant children.

Their results showed that (1) if a DIF item was found, it was most of the time in the disadvantage of the immigrant children, and, (2) this disadvantage could have been caused by several linguistic aspects, such as low-frequency words, idiomatic word combinations, context material that required knowledge of Dutch culture, and reference words. This finding of Uiterwijk and Vallen (2005) might also explain the results of the present study, namely that the children with a multilingual language background might have had problems with different types of linguistic sources in the history and geography test.

Other studies that might explain the results of the present study compared the vocabulary size of monolingual children and multilingual children (e.g. De Houwer, Bornstein & Putnick, 2013; Hoff et al., 2012; Junker & Stockman, 2002). All studies showed that multilingual children have a similar total vocabulary size as monolingual children. However, their total vocabulary size needs to be divided into two or more languages, which causes that multilingual children often have slightly smaller individual vocabularies in comparison with the vocabulary size of this individual language of monolingual children. This could mean for the present study that the multilingual children had more trouble with vocabulary in the history and geography test than the monolingual children. This might then impede the understanding of the questions for these multilingual children, which could have led to the significant difference on the total score of the test between these two groups of children.

To obtain a better insight into this phenomenon, it is advised for future research to investigate what (linguistic) sources caused these significant differences between the monolingual children and the multilingual children. For example, an addition to the present study could be to obtain children’s perceptions of the test regarding difficulty, comprehensibility, and preference, as has been done in the study of Abedi and Lord (2001). A perceptional study like this could give more insight in what sources might cause the differences in scores between the two groups based on language background. Then, a second investigation
could be to compare the elements of such a perceptual study with the linguistically complex elements that were found in the study of Uiterwijk and Vallen (2005). These suggestions could all give more insight into the causes of the differences between the scores of the monolingual children and the scores of the multilingual children that were found in the present study.

4.2.1 Related background variables in study 2

As was mentioned in the previous section, not all expectations were confirmed in study 2, because the GoT children, who had received extensive instruction in metacognitive reading strategies, did not score significantly better on history and geography than the FR children, who had not received this instruction in reading strategies. Moreover, the reversed effect was found, which means that the FR children scored significantly better than the GoT children on the total test score, and on the non-linguistic questions. There are a few more general factors that could explain these reversed findings.

Again, as a first factor, it would have been useful if there were any data present about the language scores (and reading comprehension scores in particular) of the FR children. It could be possible that these children do have generally better skills in reading comprehension than GoT children. Then, this could also explain their higher total score on the history and geography test, because these school domains are often presented in a verbal format (e.g. Rand Reading Study Group, 2002).

This explanation is also not surprising, because the FR children chose the mathematical course instead of the language course. This could suggest that their skills in language and reading comprehension are generally better. However, this has not been proven in the present study, because these data were not present. Therefore, it is recommended for future research to collect these language data for the control group as well to provide a more detailed insight in the language scores of all children before comparing their scores on other school domains.

Another factor that could have led to the reversed results could be that the course ‘Grip op Tekst’ does not only focus on reading comprehension with its belonging metacognitive reading strategies, but also on other language components, namely grammar and spelling. This means that children do not only focus on improving their reading skills. This could perhaps mean that there has not been enough exercise regarding the automatization of the metacognitive reading strategies, and that children might not be aware of the fact that they could also use these strategies for other tests in a verbal format, such as the history and geography test. Moreover, several studies have shown that, for example, there is not enough proof that spelling leads to facilitation of reading comprehension (e.g. Abbott, Berninger & Fayol, 2010; Retelsdorf &
Köller, 2014). Retelsdorf & Köller (2014) stated that reading only requires that a word needs to be differentiated from other words. Therefore, it is not necessary that the complete orthography is stored.

A factor that could explain the generally low scores on the test for all groups, could be due to fatigue. Almost all children participated in this test after their regular lesson. A few children even had taken the final test of the course during this regular lesson. This could mean that they were tired and not capable enough of concentrating for another 20 – 30 minutes to participate in the test of the present study. Therefore, it is recommended for future research to conduct this test on days when children do not have any other regular lessons in order to reduce effects of fatigue.

Furthermore, it is recommended for future research to conduct this history and geography test only with children from grade 8. This is due to the fact that this test is only conducted with children in grade 8, at the end of primary school (College voor Toetsen en Examens, 2016). The results also showed that children from grade 7 performed significantly lower than children from grade 8. Therefore, it is suggested to only choose for the older children to reduce chances of age effects.

**4.3 General discussion**

More general factors regarding the operationalization of the present study will be explained in this section, because it is expected that the inclusion of other background variables would also have provided more insight into the children’s scores for both study 1 and study 2. This is due to the finding that the children’s background variables, such as school grade and language background, seemed to have greater effects on the children’s scores than the instruction of metacognitive reading strategies in the experimental group.

The first background variable that was not included in the present study, but that is expected to affect children’s scores as well, is general intelligence. Many studies have shown that general intelligence affects children’s scores on language tasks (e.g. Hader, Skrzypek, Wingfield & Ben-David, 2016; Wolfe & Bell, 2012) and on other school domains, such as history and geography (e.g. Laidra, Pullman & Allik, 2007; Spinath, Spinath, Harlaar & Plomin, 2006). In these studies of Laidra et al. (2007) and Spinath et al. (2006), the results even showed that general intelligence was the strongest predictor for children’s scores on several school domains.

Besides these results obtained in scientific studies, in recent years there is an ongoing debate in the Netherlands about the operationalization of the tests constructed by Cito. A
growing number of publications is written about the question if these tests really measure the knowledge of children that they collect during primary school or if these tests maybe assess the children’s general intelligence instead (e.g. Müller & Pinto, 2014; Stevens, 2013). Thus, it is recommended for future research to control for these possible effects of children’s general intelligence on their scores in the different school domains.

Another background variable that should have received more attention in the present study is the children’s language background. Firstly, information about children’s language background was not present in study 1. Therefore, it is not possible to make a connection with study 2 regarding this variable. It would have been useful to have gained this information as well in study 1 to investigate if the same patterns are visible as in study 2, namely that the monolingual children scored (significantly) better than the multilingual children on the total test score.

Secondly, the information about children’s language background in study 2 needs to be treated with caution. The first reason is that the children had to report their language background themselves by answering the question about how many languages they speak at home. It can be expected that it is for children in this age range to answer this question (e.g. Pérez-Leroux, 2017), which may have resulted in placing them into the wrong group regarding language background. This was also reflected in children’s answers. For example, there were a few children who provided an answer like “we sometimes speak English at home”. This may have led to a wrong interpretation, because it is hard to estimate if the child should be classified into the monolingual group or into the multilingual group. This could have resulted into a distorted view on these results. It is therefore advised for future research to ask parents to provide information regarding their child’s language background.

Moreover, information about children’s language background consists of many more aspects than simply the number of languages spoken at home. For example, it can be considered to obtain more detailed information regarding input quantity of the languages, input quality of the languages, and language transfer. For example, many studies have shown that input quantity and input quality are strong predictors for the language skills of bilingual children (e.g. Bohnacker & Lindgren, 2016; Hoff et al., 2012; Unsworth, 2016), which probably also affects their skills on history and geography as has been measured in the present study. It would be interesting for future research to investigate what possible variables concerning children’s language background account for differences on children’s scores on these history and geography tests.
4.4 Implications of the present study

The findings of the present study suggest that the instruction in metacognitive reading strategies does affect children’s scores on reading comprehension, but that it does not affect children’s scores on history and geography. Moreover, this finding suggests that teaching children how to use metacognitive reading strategies does not positively contribute to the children’s scores on other verbal school domains, such as history and geography. This latter finding was reflected in study 2 that showed that the FR children even scored significantly better on most questions than the GoT children.

The combination of these results implicates that children are aware of using metacognitive reading strategies when they have to take a test regarding reading comprehension, but that they might not be aware of using these strategies when taking a test in other linguistically oriented school domains, such as history and geography. Therefore, these findings could contribute to school programs and policies that develop materials and instructions on metacognitive reading strategies, because the present study suggests that an explicit connection between these reading strategies and other school domains than reading comprehension has not yet been made. However, this awareness could lead to higher scores for children on these linguistic school domains.

Moreover, the present study has strong implications for the school environment, development and instruction concerning multilingual children, because the present study showed that monolingual children outperformed the multilingual children on the history and geography test. This could indicate that, for example, the multilingual children have a smaller vocabulary size than the monolingual children, which also caused them to experience more difficulty in understanding and answering the questions of the history and geography test. This is in line with results of previous findings (e.g. Haag et al., 2014; Hickendorff & Janssen, 2009; Uiterwijk & Vallen, 2005) and is therefore an implication for future research and for test constructors. This means that it is recommended for future research to pay more attention to the linguistically complex elements that cause these disadvantages to multilingual children. If these elements are determined, it can be an implication for test constructors, so that they are provided with detailed information about sources of linguistic bias that have to be taken into account for future tests that are constructed.
Chapter 5: Conclusion

Reading comprehension is a difficult and demanding task and it is considered as a challenge for children to develop skills in reading comprehension. However, more studies over the past years have shown that metacognitive reading strategies positively affect the scores of these children, because these strategies teach children how to enhance their understanding of the text.

The present study aimed to investigate if these metacognitive reading strategies also positively affect children’s scores on other school domains, namely history and geography. Those school domains were chosen, because they are often presented in a verbal format. As a first step in investigating this question, the language scores of children who had extensively received instruction in these reading strategies in an out-of-school course were compared. The results showed that the children obtained higher scores after completion of the course on reading comprehension. Thus, it can be concluded that teaching children metacognitive reading strategies positively affects their reading comprehension skills.

Then the scores on history and geography were compared. The experimental group in this study again consisted of children who received instruction in metacognitive reading strategies during the course. The control group consisted of children who followed a mathematical course, that is unrelated to metacognitive reading strategies. The first expectation could not be confirmed, because the children in the control group scored significantly better than the experimental group on the total score of the test, and on the non-linguistic questions of the test. There were no differences found between the two groups on the linguistic questions.

The second expectation was confirmed in study 2, because the monolingual children scored significantly better on the total test than the multilingual children. Therefore, the present study showed that this background variable might have greater effects on the scores of history and geography than instruction to children in metacognitive reading strategies. However, it has yet to be determined what causes these differences in scores based on variation in language background.

In summary, the present study provides many opportunities for future research. For example, it is recommended for future research to determine the reading comprehension skills of the control group to conduct more detailed comparisons between the control group and the experimental group. This would add to a more detailed insight in their skills before making the connection to the skills of both groups regarding history and geography. The present study also implicates, as was mentioned before, that it might be useful to control for several other
background variables, such as more information about the children’s language background and information about the children’s general intelligence.
References


Laidra, K., Pullmann, H., & Allik, J. (2007). Personality and intelligence as predictors of
academic achievement: A cross-sectional study from elementary to secondary school. 


Unsworth, S. (2016). Early child L2 acquisition: Age or input effects? Neither, or both?
Journal of Child Language, 43, 608 – 634.


Developmental Psychobiology, 44(1), 68 – 83.

Appendix 1
Card with metacognitive reading strategies of the course ‘Grip op Tekst’

Voorspellen
Wat verwacht ik?

Voorkennis activeren
Wat weet ik al?

Lezen

Visualiseren
Ik maak een plaatje.

Vragen stellen
Wat wil ik (nog) weten?

Samenvatten
Hoofdgeachte of 5WH?
Appendix 2
Entry test of the course ‘Grip op Tekst’

Instaptoets cursus Grip op Tekst

Onderdeel begrijpend lezen

Lees onderstaande tekst goed door en beantwoord de vragen.

1. De politie in de Amerikaanse stad Pittsburgh is op zoek naar een persoon die alligators loslaat in de stad. Inwoners en agenten stuitten de afgelopen maand op drie alligators, terwijl die er normaal niet voorkomen.

2. De kleinste van het stel was bijna 1 meter lang, de grootste zo'n 1,5 meter. Volgens de lokale politie vormen de alligators “een gevaar voor kinderen en huisdieren”, zeker omdat de beesten langer dan 3 meter kunnen worden.

3. De dieren komen wel voor in staten als Florida en Louisiana, maar volgens agenten is het onwaarschijnlijk dat die hun natuurlijk leefgebied hebben verlaten om in de stad terecht te komen. Daarom wordt gedacht aan een eigenaar die van de beesten af wilde komen.

4. Bij een van de alligators is dat al vastgesteld, toen de politie het huis binnenviel waar het dier was gevonden. Daar werden nog eens 32 dieren in beslag genomen, waaronder drie alligators en twee pythons.


__________________________________________________________________________

2. Noteer de regelnummers van de inleiding, het middenstuk en het slot.

Inleiding: regel _____ t/m regel _____.
Middenstuk: regel _____ t/m regel _____.
Slot: regel _____ t/m regel _____.

3. Wie hebben de drie alligators ontdekt in Pittsburgh?

__________________________________________________________________________

4. Waarom zijn deze alligators zo gevaarlijk voor kinderen en huisdieren volgens de lokale politie?

__________________________________________________________________________

5. Waarom denkt de politie dat er sprake is van iemand die van de dieren af wilde?

__________________________________________________________________________

6. Wat is het doel van deze tekst?
Gebruik in je antwoord één van de volgende woorden: overtuigen - uitleggen - vermaken - informeren

__________________________________________________________________________

__________________________________________________________________________

7. Geef van de onderstreepte, dikgedrukte signaalwoorden uit de tekst het juiste verband.
Kies uit: reden (2x) - tijd - opsomming - voorbeeld - tegenstelling

en (r.5) = ___________________________________________________________________
omdat (r.6) = ___________________________________________________________________
maar (r.7) = ___________________________________________________________________
daarom (r.9) = ___________________________________________________________________
toen (r.11) = ___________________________________________________________________
waaronder (r.13) = ___________________________________________________________________

8. Wat voor soort structuur heeft de tekst?
Kies uit: oorzaak-gvolg, mening-argumenten, voordelen-nadelen of overeenkomst-verschil

__________________________________________________________________________

9. Wat is de hoofdgedachte van de tekst?

__________________________________________________________________________
10. Geef een samenvatting van de tekst in maximaal vier regels.

___________________________________________________________

___________________________________________________________

___________________________________________________________

___________________________________________________________

Onderdeel spelling

1. Verdeel onderstaande woorden in klankgroepen.

boterkoek
grappen
uitlaten


da-del
mee-lo-per
uit-da-ging
win-ter

3. Geef het meervoud van onderstaande woorden.

eén kabelbaan
eén begrip
eén kolonie
eén strategie
eén flauwerik
eén farao
twee
twee
twee
twee
twee

4. Wat is het grondwoord van de volgende afleidingen?

waardeloos
ongelooflijk
menselijk
biologisch

5. Maak van onderstaande woorden een samenstelling.

beweging + ruimte
roos + geur
zon + schijn
tarwe + brood
ziekte + bed
6. Schrijf de juiste vorm van de van het werkwoord tussen haakjes op.
(t.t. = tegenwoordige tijd, v.t. = verleden tijd, v.d. = voltoooid deelwoord, o.v.d = onvoltoooid deelwoord)

a. Dat stel heeft een kindje uit China _____________________________ (adopteren, v.d.).
b. Hij _____________________________ (besteden, v.t.) veel tijd aan zijn werkstuk.
c. _____________________________ (Houden, t.t) de deur voor mij open, alsjeblieft!
d. De vrienden _____________________________ (overleggen, t.t.) waarnaartoe ze op vakantie gaan.
e. _____________________________ (Plagen, o.v.d) vroeg haar broertje of Marloes verliefd was.
f. De slager _____________________________ (snijden, t.t.) het grote stuk vlees in drie gelijke stukken.
g. Ik _____________________________ (verbieden, t.t.) mijn leerlingen te eten in de klas.
h. Voordat de operatie begon, werd de patiënt _____________________________ (verdoven, v.d.).
i. De storm _____________________________ (verwoesten, v.t.) het hele dorp.
j. De misdadiger is naar het buitenland _____________________________ (vluchten, v.d.).

Onderdeel grammatica

1. Benoem de woordoorten in de zin:

Hij brengt zijn werkdag door in een ruim, nieuw kantoorpand.

Kies uit: zelfstandig naamwoord (znw) - lidwoord (lw) - bijvoeglijk naamwoord (bnw) - werkwoord (ww) - voorzetsel (vz) - persoonlijk voornaamwoord (pvnw) - bezittelijk voornaamwoord (bvnw)

Sommige woordoorten kunnen vaker voorkomen.

Hij =
brengt =
zijn =
werkdag =
door =
in =
een =
ruim =
nieuw =
kantoorpand =
2. Deel onderstaande zinnen op in zinsdelen én benoem ze.  
Kies uit: persoonsvorm - onderwerp - werkwoordelijk gezegde - lijdend voorwerp - meewerkend voorwerp

Ahmet gaf zijn zus een enorme bos bloemen.

onderwerp = ___________________________________
persoonsvorm = ___________________________________
werkwoordelijk gezegde = ___________________________________
lijdend voorwerp = ___________________________________
meewerkend voorwerp = ___________________________________

Mathilde heeft alle koekjes opgegeten.

onderwerp = ___________________________________
persoonsvorm = ___________________________________
werkwoordelijk gezegde = ___________________________________
lijdend voorwerp = ___________________________________
meewerkend voorwerp = ___________________________________

Koopt dit meisje drie cadeautjes voor haar vriendje?

onderwerp = ___________________________________
persoonsvorm = ___________________________________
werkwoordelijk gezegde = ___________________________________
lijdend voorwerp = ___________________________________
meewerkend voorwerp = ___________________________________

3. Schrijf de volgende zinnen over met de juiste interpunctie en hoofdletters.

heeft lisa van zomeren echt hardloopschoenen van asics gekocht

___________________________________________________________

voor deze sporten kun je je aanmelden turnen voetballen hockey en karate

___________________________________________________________

wat hebben jullie er een puinhoop van gemaakt riep onze moeder

___________________________________________________________

Onderdeel woordenschat

Omcirkel het goede antwoord.

1. Welk woord past het best op de lijn in de volgende zin?
   Jan Smit zorgt wekelijks voor ________ in dat café.
   a. entertainment
   b. publiciteit
   c. recensies
2. Wat is een synoniem voor het onderstreepte woord in de volgende zin?

*De Romeinen zegevierden in vele oorlogen.*

a. verloren  
b. wonnen  
c. overleefden  
d. deden mee

3. Welk woord past het best op de lijn in de volgende zin?

*Mijn broertje zegt dat hij gisteren een buitenaards wezen heeft gezien, maar volgens mij is dat ________.*

a. origineel  
b. betekenisloos  
c. lariekoek  
d. rampzalig

4. Welk woord past het best op de lijn in de volgende zin?

*Mijn moeder probeerde de ruzie tussen mijn zus en mij te ________.*

a. sussen  
b. vergezellen  
c. ophitsen  
d. fuseren

5. Welk woord past het best op de lijn in de volgende zin?

*Benzine is een ________ goedje.*

a. culinair  
b. chemisch  
c. biologisch  
d. schuchter

6. Wat betekent het onderstreepte woord in de volgende zin?

*Vandaag wordt de **fundering** van het nieuwe schoolgebouw gelegd.*

a. houten vloer  
b. financiering  
c. dat waar een gebouw op steunt  
d. elektronische apparatuur

7. Wat betekent het onderstreepte woord in de volgende zin?

*De **assistent** hielp met het werk op de computer.*

a. iemand die veel van computers weet  
b. iemand die tussen de vijftien en twintig jaar oud is  
c. iemand die iemand anders helpt bij zijn werk  
d. spellingscontrole

8. Welk woord past het best op de lijn in de volgende zin?

*De leerlingen volgden het ________ van de juf op.*

a. bevel  
b. kavel  
c. privilege  
d. orde

9. Welk woord past het best op de lijn in de volgende zin?

*Ik vind het knap hoe Mozart al zo jong muziekstukken kon ________.*
a. salueren
b. fascineren
c. componeren
d. fouilleren

10. Wat betekent de uitdrukking: ‘iemand in de maling nemen’?
   a. een vervelende beslissing aan iemand anders overlaten
   b. ruzie krijgen met iemand
   c. iemand vervangen
   d. iemand voor de gek houden
Appendix 3

History and geography task (version A).

Onderzoekje

Hartstikke fijn dat jij mee wilt doen aan dit onderzoekje! Op de volgende pagina staan 20 meerkeuzevragen die gaan over geschiedenis en aardrijkskunde. Bij elke vraag is er maar één antwoord goed, dus je mag maar één letter omcirkelen. Probeer voor iedere vraag een antwoord in te vullen, ook als je niet zeker weet of dat antwoord goed is!

Voordat je begint, moet je eerst onderstaande gegevens invullen:

- Naam: _________________________________________________
- Geboortedatum: ________________________________________________
- Groep: _________________________________________________
- Ik ben een jongen / meisje
- Ik doe de cursus Grip op Tekst / Foutloos Rekenen
- Hoeveel lessen heb je gehad van de cursus?
  ______ lessen
- Hoeveel talen worden er bij jullie thuis gesproken?
  _______________________________________________________
- Welke talen worden bij jullie thuis gesproken?
  _______________________________________________________

---

58
Lees eerst goed de vragen voordat je antwoord geeft.

Opgave 1
Ecuador en Uganda

Op de kaart zie je waar de landen Ecuador en Uganda liggen. Wat is een belangrijke overeenkomst tussen deze landen?

A Beide landen liggen aan een oceaan.
B Beide landen liggen op het westelijk halfrond.
C Beide landen liggen op de evenaar.
D In beide landen liggen woestijnen.

Opgave 2
Vrijheid en gelijkheid

Everhard zegt in 1785: “Ik ben voor vrijheid en gelijkheid. Het is niet belangrijk of je nu wel of niet van adel bent. Het gaat erom wat je zelf kunt. Ook gewone mensen moeten kunnen meepraats over hoe het land bestuurd wordt.” Bij welke groep hoort Everhard?

A bij de edellieden
B bij de Patriotten
C bij de Prinsgezinden
D bij de regenten

Opgave 3
Geloof

Twee kinderen hebben een foto gemaakt die te maken heeft met hun geloof.
Wie hoort bij het christelijke geloof?

A alleen Bram  
B alleen Teus  
C beiden  
D geen van beiden

Opgave 4
Hoog- en Laag-Nederland

Welke van de volgende steden zullen overstroomen als er geen dijken zijn?

A Assen en Emmen  
B Breda en Tilburg  
C Delft en Leiden  
D Enschede en Hengelo

Opgave 5
Scheepvaart tussen Europa en Azië

Het schip op de foto vaart op de Noordelijke IJssee van Europa naar Azië. De meeste schepen die tussen Europa en Azië varen, gebruiken de zuidelijke vaarroute langs Afrika. Hoe zal de situatie over ongeveer tien jaar zijn?

A Er zullen meer schepen over de Noordelijke IJssee varen, omdat de zuidelijke vaarroute erg druk wordt.  
B Er zullen meer schepen over de Noordelijke IJssee varen, omdat er minder ijs zal zijn.  
C Er zullen nog steeds weinig schepen over de Noordelijke IJssee varen, omdat de zuidelijke vaarroute veel sneller gaat.  
D Er zullen geen schepen meer over de Noordelijke IJssee varen, omdat er meer ijs zal zijn.
Opgave 6
Papiergeld

Je ziet hier een aantal guldenbiljetten.
Rond welk jaar werden deze biljetten voor het laatst gebruikt?

A  rond 1930
B  rond 1950
C  rond 1980
D  rond 2000

Opgave 7
Uit een verhaal over de geschiedenis van West-Europa:
"De heerweg was lang, saai en hobbelig. Aan het hoofd van een groep soldaten marcheerde Florian van mijlpaal naar mijlpaal. Af en toe zagen de soldaten in de verte een villa, waar slaven op het land werkten. Florian was blij dat hij geen slaaf was. Vanavond zouden ze in de stad zijn. Dan was hij vrij en kon hij zich vermaken in het badhuis en op de tribune van het amfitheater genieten van de gevechten tussen gladiatoren."

In welke tijd kan dit verhaal zich hebben afgespeeld?

A  in de tijd van Grieken en Romeinen (rond het jaar 200)
B  in de tijd van monniken en ridders (rond het jaar 900)
C  in de tijd van steden en staten (rond 1450)
D  in de tijd van regenten en vorsten (rond 1650)

Opgave 8
Kaart

Welke titel past het best bij deze kaart?
Opgave 9
Boeken overschrijven

Het overschrijven van boeken was een belangrijke taak voor monniken in de middeleeuwen. Dit boek met gebeden komt uit 1460. Honderd jaar later werden er bijna geen boeken meer overgeschreven. Waardoor kwam dat vooral?

A Boeken werden toen gedrukt, overschrijven was niet meer nodig.
B De paus verbood het overschrijven van boeken want het was tegen Gods wil.
C Er waren steeds minder monniken om dit werk te doen.
D Mensen waren niet meer geïnteresseerd in boeken over geloof.

Opgave 10
Foto van de aarde

Welke letter op deze foto van de aarde staat op de evenaar?

Kies A, B, C of D.
Opgave 11
Grootschilderingen

Op de foto zie je een schildering met dieren in een grot bij Lascaux in Frankrijk. Deze is een van de oudste kunstwerken die we kennen. Wie hebben deze schildering gemaakt?

A jager-verzamelaars
B prehistorische boeren
C Romeinse kunstenaars
D middeleeuwse monniken

Opgave 12
Noord-Italië

Hierboven zie je een wegenkaart van Noord-Italië. Paulo rijdt van Trento naar het noorden. In welk land komt Paulo als hij Italië verlaat?

A in Duitsland
B in Frankrijk
C in Griekenland
D in Oostenrijk
Opgave 13
Handel
In de tijd van ontdekkers en hervormers (1500-1600) groeiden de Nederlanden uit tot een belangrijk Europees handelscentrum. Hout en graan uit landen rondom de Oostzee en zout en wijn uit Spanje en Frankrijk werden naar Nederlandse havens gebracht. Hier werden ze dan weer door Nederlandse handelaren doorverkocht.

Waarom werden juist de Nederlandse havens uitgekozen?

A De heerser van de Nederlanden uit die tijd was ook koning van Spanje en keizer van het Heilige Roomse rijk. Daarom was hij zeer geliefd en dreef iedereen graag handel met de Nederlanden.

B De Nederlanden hadden in die tijd te maken met overbevolking. Daarom konden de buitenlandse handelaren hun handelswaar hier gemakkelijk kwijt.

C De Nederlanden lagen tussen het zuiden en de Oostzee in. Als de handelaren hun spullen hier verkochten, hoefden ze nooit heel lange reizen te maken.

D De Nederlanden waren destijds het Europese centrum van de schilderkunst. Veel buitenlandse handelaren kwamen hier om musea te bezoeken. De Nederlandse handelaren maakten van die situatie gebruik door met deze mensen te handelen.

Opgave 14
Nederlandse krant in Spanje

Het is 5 juni, 9 uur 's morgens. Meneer Bartels woont in het zuiden van Spanje. Hij leest daar een Nederlandse ochtendkrant van vandaag, 5 juni.

Hoe kan het dat meneer Bartels een Nederlandse krant van dezelfde dag in een winkel in Zuid-Spanje kan kopen?

A De Nederlandse krant heeft een kantoor met eigen verslaggevers in Spanje.

B De Nederlandse krant laat de mensen van de Spaanse krant El País een krant in de Nederlandse taal maken.

C De Nederlandse krant wordt met snelle vrachtauto's van Nederland naar Spanje vervoerd.

D De Nederlandse krant wordt 's nachts in Nederland via het internet naar Spanje gestuurd en daar gedrukt.
Opgave 15
In de rechtbank

Wie is aan het woord?

A de advocaat
B de officier van justitie
C de rechter
d een getuige

Opgave 16
Kaart zonder titel

Welke van de volgende titels past het best bij deze kaart?

A Aantal inwoners van de steden in Noord-Holland
B Aantal inwoners van de steden in de Randstad
C Grenzen van de steden in Noord-Holland
d Grenzen van de steden in de Randstad
Opgave 17
Duikboot in het ijs

Een duikboot maakt een reis om de wereld. Een deel van de reis vaart de duikboot onder een dikke ijskap. Alleen bij een dunne plek in het ijs kan de duikboot aan de oppervlakte komen. Op welk deel van de reis zal de duikboot onder het ijs door zijn gevaren?

A tussen Groenland en Alaska
B tussen Alaska en Mexico
C tussen Mexico en Australië
D tussen Australië en Antarctica

Opgave 18
Beschermde dieren

Dassen zijn net als heel veel andere in het wild levende dieren in Nederland beschermd door een wet. Dat betekent dat die dieren niet mogen worden gestoord in hun omgeving. Ze mogen ook niet worden gedood, verwond of gevangen.
Wie hebben er in Nederland beslist dat deze wet om dieren te beschermen werd ingevoerd?

A de burgemeesters van alle gemeenten in Nederland
B de Dierenbescherming
C de leden van de Partij voor de Dieren
D de Tweede en de Eerste Kamer
Opgave 19
Afghanistan

Afghanistan is een land in Azië. Het land is op de kaart rood gekleurd. Afghanistan ligt ingesloten tussen andere landen. Als de bewoners een zee willen bereiken, moeten ze door een ander land reizen. Er zijn meer landen op de wereld die, net als Afghanistan, ingesloten liggen tussen andere landen. Welk van de volgende landen in Europa hoort daarbij?

A  België
B  Finland
C  Oostenrijk
D  Portugal

Opgave 20
Vliegveld van Dubai

Dubai is een land in het Midden-Oosten. Dankzij de gunstige ligging is het vliegveld van Dubai een belangrijk vliegveld op de wereld.

Waarom heeft het vliegveld een gunstige ligging?

A  Dubai ligt in het Midden-Oosten. Veel olie uit het Midden-Oosten wordt per vliegtuig vervoerd.
B  Dubai ligt midden in een dichtbevolkt gebied waar veel klanten voor vliegreizen wonen.