Types and sequences of self-regulated reading of low-achieving adolescents in relation to reading task achievement

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This study examines the relationship between types and sequences of self-regulated reading activities in task-oriented reading with quality of task achievement of 51 low-achieving adolescents (Grade 8). The study used think aloud combined with video observations to analyse the students’ approach of a content-area reading task in the stages of orientation, text reading and answering questions. Results show that in general these low-achieving adolescents are infrequently monitoring their text comprehension or making connections with prior knowledge. Nevertheless, important differences are found between types and sequences of self-regulated reading activities related to task achievement. The low-achieving adolescents showing a straightforward linear approach to the task (orientation, reading of the whole text and finally answering of questions) yielded more success. In addition, readers demonstrating more activities directed at connections between text contents and prior knowledge during reading showed better task achievement. Implications of these findings for literacy education of this special group of adolescents are discussed.

Reading comprehension is an important factor for academic and professional success and a requirement for participation in the information society. Although many adolescents acquire sufficient competence in reading comprehension without much difficulty, various studies have shown that a substantial part of the adolescent student population struggles with reading comprehension and performs below the levels required by the school curriculum (Alliance for Excellent Education, 2006; Hofman, Spijkerboer & Timmermans, 2009; Inspectie van het Onderwijs, 2008; OECD, 2003). These findings led to calls for a better understanding of the specific challenges of adolescent literacy, especially of low-achieving adolescents.
A great deal of research showing how readers of diverging proficiency process a text and achieve text comprehension has been performed (Baker & Brown, 1984; Pearson, Roehler, Dole & Duffy, 1992; Pressley, 2000; Oakhill & Cain, 2007; Trabasso & Bouchard, 2002; Vidal-Abarca, Mañá & Gil, 2010). These studies show that less proficient readers have problems with one or more of the following: (a) decoding words; (b) speed and accuracy; (c) understanding the meaning of words; (d) activating meaning-making processes; (e) applying self-regulation. The problems of low-achieving adolescent readers thus are diverse. Some low-achieving adolescent readers still have difficulty in reading words accurately, yet these students make up a minority. Most of them read words accurately but have problems with comprehension as a result of knowledge deficits (vocabulary, grammar, metacognitive knowledge, genre and conceptual knowledge) and with self-regulation of reading, roughly defined as purposeful activities carried out by readers in order to steer and control their approach of the reading task (Alvermann, 2001; Biancarosa & Snow, 2006; Kucan & Palincsar, 2011). Such self-regulation is based on knowledge about the task, the own competence to carry it out and the motivation to succeed (cf. Zimmerman & Risemberg, 1997).

To enhance our understanding of adolescent literacy, more knowledge is needed on how students approach reading in educational practice, the so-called task-oriented reading. In general, task-oriented reading aims at the use of one or more texts to answer questions, to write an essay or ‘to give some sort of written answer while having the text information available to search’ (Vidal-Abarca et al., 2011, p. 180). Reading in education is embedded in all school subjects, while expository text genres become of increasing importance in adolescence (Fang & Schleppegrell, 2010). In the content areas, students usually read texts, knowing that they have to perform a task for which the texts are a crucial source of information, which makes this type of task-oriented reading different from leisure reading or text analysis in the language arts (Perfetti et al., 1995; Vidal-Abarca et al., 2010). For example, students explore texts about World War 2 in history lessons to prepare a presentation. The self-regulation of reading in these situations requires not only comprehension of the text but also of the task and knowledge about how to proceed with the task involved.

**Self-regulated task-oriented reading**

Self-regulation means that students plan, execute and control their behavioural and cognitive activities (Boekaerts & Simons, 1993). For successful task achievement, readers need to orient not only on the information the text provides but also on task requirements, the goal of the task and approaches to attain this goal. In addition, readers need to monitor their text comprehension and their execution of the task (finding appropriate information to fulfil the assignment). Comprehension of the assignment (such as answering specific questions) involves the integration of propositions within the assignment in combination with the information provided by the text to construct a coherent representation of the assignments’ demands (Cataldo & Oakhill, 2000; Rouet, 2006). After understanding the assignment, readers have to decide whether they can solve it immediately or whether consultation of the text is needed. Once readers have decided to search the text for specific information, they have to select and process relevant parts from the text, which also involves self-regulation (Cerdán & Vidal-Abarca, 2008; Vidal-Abarca et al., 2010).

Two characteristics of task-oriented reading have important consequences for the way readers approach the texts in question. If we consider the typical situation in content-area
education in which both the task and the text are available to the students all the time (i.e., students know that they are reading the text in order to complete a specific task), the following applies. First, only information conditional for executing the task successfully is relevant for the reader, which may result in readers selecting some parts of the text to read, instead of reading it in its entirety (Cerdán, Vidal-Abarca, Martinez, Gilabert & Gil, 2009). Second, readers need to change their focus of attention from text to task several times, until the task is carried out properly. Carrying out this type of reading tasks is a complex cyclic process that requires active self-regulation next to efficient decoding skills, adequate vocabulary, interest and familiarity with the topic and text genre (Baker & Brown, 1984; Guthrie & Wigfield, 1997; Pressley, 2000).

A variety of self-regulated activities directed at reading tasks are proposed in the literature, including the following: (1) predicting: activation of prior knowledge based on clues within the text such as graphics and (sub)headings; (2) inferring: connecting text contents to own ideas and knowledge; (3) self-questioning: drawing on content knowledge to investigate the text and to monitor comprehension; (4) skimming: glancing through the text to gain a general impression of the content; (5) scanning: locating specific details such as names, dates and places; (6) determining importance/summarising: deciding what is most important; (7) paraphrasing: putting information in the text into own words; (8) rereading: rereading words or sentences to clarify meaning; (9) reading on: jumping over unfamiliar words to determine meaning from the context; and (10) consulting: using a dictionary or knowledgeable others to determine word meanings (Duke & Pearson, 2002; Meijer, Veenman & Van Hout-Wolters, 2006; Pressley, 2000).

Differences in self-regulated reading of low-achieving adolescents

Vidal-Abarca et al. (2010) demonstrated that poor readers in Grades 7 and 8 did not only give poorer answers to questions in reading tasks than good readers but were also less successful in deciding at what occasions they should consult the text or not, compared with their more proficient classmates. Such findings point to differences in self-regulatory skill between poorer and more proficient adolescent readers. Biancarosa and Snow (2006) suggest that difficulties with self-regulation are not the same for all low-achieving adolescent readers. For some, the problem may be that they do not read with sufficient fluency, inhibiting self-regulated activities directed at comprehension needed for task achievement (both task and text comprehension). Others may lack a repertoire of self-regulated activities to help them comprehend what they read (how to grasp the gist of a text, to notice and repair misinterpretations and to adapt their approach to the purpose of the reading task). Still other low-achieving adolescent readers engage in several self-regulated activities but have difficulties in using them effectively, as a result of little practice in a limited range of texts, genres and contexts. Finally, some low-achieving adolescent readers may not go beyond construing a ‘textbase’ and do not connect this textbase to their prior knowledge (Kintsch & Kintsch, 2005). Initial access to the written text is necessary to construe the so-called textbase. Readers use the text to achieve an understanding of the literal meaning of the text. However, to achieve text comprehension, which is a prerequisite for finding and selecting relevant textual information for task completion, readers must construct a ‘situation model’ by integrating the textbase with their prior knowledge (Kintsch & Van Dijk, 1978). Rapp, van den Broek, McMaster, Kendeou and Espin (2007) report finding two different types of processing by low-achieving adolescent
readers in this respect, some oriented solely towards literal representation of segments of text, whereas others connected text segments with irrelevant or incorrect prior knowledge. Activities to connect text contents with existing (and relevant) knowledge are necessary to comprehend text in a way useful for task-oriented reading (Chambers Cantrell, Almasi, Carter, Rintamaa & Maden, 2010; Graesser, 2007).

Present study

Differences concerning self-regulation in task-oriented reading among low-achieving adolescents have been proposed in the literature (Alexander & Murphy, 1998; Biancarosa & Snow, 2006), but it is not clear what differences can be empirically found and to what degree they are relevant for task achievement. Although such differences have been demonstrated between readers of lower and higher proficiency (Vidal-Abarca et al., 2010), it is useful to know whether differences in task achievement within the group of low-achieving adolescent readers are related to differences in regulation. If so, it is informative to know which types and sequences of self-regulated activities are related to more successful task achievement. Such understanding is not only of scientific interest but is also informative for educational interventions directed at reading strategies of this particular group of students.

The following questions are addressed in this study:

1. What types of self-regulated activities do low-achieving adolescents engage in most frequently in task-oriented reading in the case of a question-answering task, representative for content-area education? From the previous literature, it is expected that low-achieving adolescents predominantly use self-regulative activities directed at the construction of a textbase and show few activities directed at connecting the textbase to their prior knowledge in order to create a situation model of the text, needed for finding and selecting task-relevant information.

2. What relationships exist between the types of self-regulation activities in the different stages of task-oriented reading (in the aforementioned type of task) and task achievement? It is expected that low-achieving readers who show more self-regulation directed at connecting the text contents to their prior knowledge show better task achievement than their classmates.

3. Which differences in sequences of self-regulated reading exist between low-achieving adolescent readers who obtain the highest, average and lowest achievement? Given the lack of empirical data in the literature, there are no specific expectations about particular sequences leading to better task achievement. For that reason, this question is treated as explorative.

Method

Participants

Low-achieving adolescent readers are defined in this study as students in the lowest 30 percentile of academic skills as measured by an aptitude test measuring language, reading and mathematics skills prior to admission to Dutch secondary education. In the Netherlands, these
low-achieving readers are enrolled in the two lowest tracks of secondary education. The study involved a sample of 51 students (22 girls and 29 boys) from 11 eighth-grade classrooms from 10 ethnically mixed schools in the two lowest tracks of secondary education in the Netherlands. The students were between 13 and 15 years old ($M = 14.7$). Twenty-four students had a monolingual Dutch background; the other 28 students were bilinguals with various ethnolinguistic backgrounds. Most of them had Moroccan or Turkish backgrounds, and the remainder had Surinamese, Antillean, Cape Verdean and Chinese backgrounds. All but five of the bilingual students were born in the Netherlands and thus are second-generation immigrants. Immigrant children who had visited a Dutch primary school for less than 3 years were excluded in order to keep the immigrant sample homogeneous with respect to previous schooling experiences and related occasion for acquisition of Dutch. Furthermore, students diagnosed with a learning or behavioural disorder (e.g., dyslexia or attention deficit hyperactivity disorder) were excluded from the sample in order to ascertain that self-regulatory activities were not related to specific learning or behavioural disorders. The participating students were involved in a broader (longitudinal) study in which reading comprehension was measured by a reading achievement test (Van Steensel, Oostdam & van Gelderen, 2013). The monolingual and bilingual students in this study did not differ significantly in reading comprehension, $F_{(1, 51)} = 1.384, p = .25$.

**The reading task**

The reading task was designed for studying the normal task approach of low-achieving readers in a setting typical of their school curriculum. An observational study of the target group (Authors, Year) revealed that reading in content-area subjects is typically embedded in tasks in which brief texts containing pictures, maps and graphics are used as sources of information to answer questions about topics to be learned. Therefore, the task described in the following was modelled to be similar to such tasks found in social studies textbooks used in the students’ classrooms. In addition, the students were asked to approach the task in the same way as similar tasks at school or as homework. In accordance, the students were free to use any approach and any sequence that seemed reasonable to them. The task consisted of an introduction explaining the assignment, a text and text comprehension questions (Figures 1 and 2). The text and questions remained available to them all of the time.

The text was an informative article about the war in Afghanistan and the Dutch military mission in the province of Uruzgan. At the time of the study (2010–2011), this mission – and discussion about its usefulness – was a current topic in the news for several years. For that reason, it could be expected that the text was of interest to many students in our target group. The text was retrieved from a news website directed to young people, but some features were added to meet the principles of a good study text (Land, Sanders & Van den Bergh, 2008) and to meet the study’s purposes: (1) the text was adapted to make it appealing for both boys and girls; (2) pictorial information was added (a map of the region and photographs of soldiers at work); (3) some difficult vocabulary items were added; and (4) following the **Error Detection Paradigm** (Hacker, 1998), an inconsistency was added to analyse comprehension-monitoring processes. The inconsistency involved the suggestion that the Americans would appreciate another attack by Al Qaida (Figure 1, third sentence). Following Kintsch and Van Dijk (1978), it was assumed that integrating ideas within the text with prior knowledge would result in detection of the faulty proposition and lead to observable fix-up activities to repair comprehension.
Figure 1. The reading task (translated) and standards for good answers.

Translation of the text in English

Afghanistan: An awkward dilemma
(ANP) By our reporter

Amsterdam- On the day of September 11 2001 the assaults in New York and Washington took place. Hundreds of innocent Americans were killed, the Twin Towers were destroyed and the Pentagon was heavily damaged. According to the Americans, the terrorist Osama Bin Laden is responsible for these murderous attacks. The Americans want this to happen again and went looking for the suspect. In October 2001 the Americans and British invaded Afghanistan. They thought that Bin Laden and his accomplices of Al Qaida were hidden in the mountainous desert of that country.

The Dutchmen in Afghanistan In the year 2009 there are still foreign soldiers in Afghanistan, because Bin Laden still hasn't been found yet. There are not only American and British troops, but also the Dutch military is assisting. By far most Dutch soldiers are camping near Deh Rawood and Tarin Kowt, in the province of Uruzgan (see map). The Dutch peace mission is dominated by the need to improve safety and for reconstruction. And they help constructing new roads, drilling water wells and building schools. Thanks to them, more and more Afghans people again have clean drinking-water and a lot of children can go to school again. Yet it is not going as well as hoped for. The lack of safety is the biggest problem. Because of the continued combats many Afghan civilians still feel very unsafe.

Stay or leave? It is clear that the soldiers have an important task, but that it also is a very dangerous one. On the one hand, Afghanistan is far from safe and foreign aid is sorely needed. On the other hand, there are many Afghans who view the foreign soldiers as enemies. This makes the work dangerous. Insurgent Afghans plant mines and commit assaults with roadside bombs to cross the soldiers. In the meantime already eighteen Dutch soldiers have died. Some were very young, like 20-year old Timo Smeehuijzen. Because of the danger and the risks many Dutch people wonder whether it is wise for the Dutch military to stay in Afghanistan. Public opinion is divided. Sergeant Bas Visser (23 years), just returned from Uruzgan, thinks they should. He says: "We started this job, so we should finish the contract. Halfway ceasing the mission is a bad idea. The Afghan youth deserves just as good a future as we have".

Timo Smeehuijzen’s girl friend thinks different. She says: "I feel terrible that Timo isn’t there anymore. Family and friends of other soldiers should be spared such grief". So, an awkward dilemma. What is the best decision? That the soldiers finish the job they started? Or that they return home unharmed as soon as possible?

Caption 1 (above left): Dutch soldiers on patrol
Caption 2 (above right): Dutch soldiers distribute toys
Caption 3 (below): Important cities in Afghanistan
Five questions were designed to assess three main aspects of reading task achievement, derived from the Programme for International Student Assessment taxonomy (OECD, 2003) and similar to the taxonomy used by Vidal-Abarca et al. (2010): (1) retrieving information, (2) interpreting text and (3) reflecting/evaluating (Figure 1). The first question asked for the main idea of the text to assess whether the reader was able to state the gist of the text (reflection/evaluation). The second and fourth questions asked for interpretations. This type of question requires an inference based upon a part of the text, tapping the richness of the readers’ situation model. The third question asked for literal retrieval of information from the text. This question tapped the readers’ textbase. The fifth question asked about the origin and genre of this type of texts (reflection/evaluation). Together, the five questions allow a quite general evaluation of the success of the students’ reading task performance.

Procedure

For the investigation of self-regulated reading, a think-aloud study was conducted in combination with analysis of video recordings of students executing the reading task. All sessions were individual and took place in scheduled hours during a school day. The students were handed the complete task on paper (Figure 2). They were told that the researchers were interested in their usual approach towards reading assignments for school. They were also told that they were free in how they wanted to proceed. Students were allowed to use a dictionary. They were asked to verbalise their thoughts and actions while executing the task (Ericsson & Simon, 1993). In addition, students were asked to read aloud, enabling observation of some important activities such as rereading, pausing or reading headings. To clarify the idea of thinking aloud, a short demo clip was shown in which an adolescent boy reads a newspaper article and verbalises what he is reading and thinking. When students kept silent for more than 5 seconds, the experimenter encouraged them to keep thinking aloud. The experimenter used prompts like: ‘Keep on talking, please’. However, prompting to think aloud was rarely necessary. If students asked for help, the experimenter was allowed to help them because asking for help is a self-regulating activity in itself. However, the experimenter was not allowed to prompt answers to one of the questions of the assignment. In most cases, students asked for meanings or pronunciation of words. Their answers to the questions were given verbally to the experimenter.

Scoring

The students’ task approach was analysed by using a scheme describing indicators of self-regulated reading activities. The literature about self-regulation is quite ambiguous about the role of conscious processing (Dinsmore, Alexander & Loughlin, 2008). In addition, on the basis of mere observation of verbal and nonverbal activities of readers, it is not possible to make a clear distinction between activities that are preceded by a conscious decision to act and activities that are not. For that reason, all behavioural, cognitive and metacognitive activities that seem to be purposeful in the context of task-oriented reading

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1Research into the effects of reading mode (aloud or silent) on comprehension and the reading process is equivocal (Kragler, 1995; McCallum, Sharp, Bell & George, 2004) and gives no clear reasons for selecting one or the other mode for this study. Reading aloud was preferred, because it allowed us to register students’ reading activities in a more detailed fashion than silent reading would. In lessons directed at these students, we observed that they were familiar with reading aloud (De Milliano, 2013). To avoid inference of reading aloud on comprehension processes, the students were told explicitly that they would not be evaluated on the quality of their pronunciation.
In 2001 vielen de Amerikanen en Britten Afghanistan binnen. Sinds een paar jaar zijn er ook Nederlandse soldaten in Afghanistan. De opdrachten gaan hierover.

Maak opdracht 1 en 2 en gebruik hierbij de tekst.

Veel succes!

Opdracht 1 – Afghanistan: een lastig dilemma

Vertel je antwoorden tegen de onderzoeker.

1. Vertel in je eigen woorden in het kort waar de tekst over gaat.
2. Waarom hebben de Amerikanen Afghanistan aangevallen?
3. Met welk doel zijn de Nederlandse soldaten in Afghanistan?
4. Wat is het dilemma?
5. Waar zou je deze tekst kunnen tegenkomen? Waarom?

Afghanistan: Een lastig dilemma

(ANP) Door onze verslaggever


Nederlanders in Afghanistan


Blijven of wegaan?

Hetzelfde geldt voor de Nederlandse soldaten. Zij zijn er om de veiligheid te garanderen en de mensen te helpen die in de gaten van de Taliban zitten. Maar de vrede is niet eenvoudig te verwezenlijken. De mensen zijn bang voor de Taliban en de soldaten vragen zich af of ze wel veilig zijn. De situatie is complex en soms lijkt het alsof niets goed gaat. Maar de Nederlanders blijven vasthouden aan hun belofte aan de Afghaanse burgerbevolking. Ze willen ervoor zorgen dat de mensen veiligheid krijgen en een betere toekomst hebben.

De meningen zijn verdeeld. Sergeant Bas Visser (23 jr.), net terug uit Uruzgan, vindt van wel. Hij zegt: “We zijn aan deze klus begonnen, dus moeten we het halverwege staken. De missie is niet zo’n goede toekomst als wij.” De vriendin van Timo Smeeshijn, die ook bij de Nederlandse militairen betrokken is, zegt: “Ik vind het fijn dat Timo er niet meer is. Dit verdriet moet familie en vrienden van andere militairen bespaard worden.” Een lastig dilemma dus. Wat is het beste besluit? Dat de soldaten het werk waaraan ze zijn begonnen afmaken? Of dat ze zo snel mogelijk heen en weer teruggaan naar Nederland?

Figure 2. The original task layout.

were defined as self-regulated. Even when there is no observable decision that precedes them, such activities are regarded as driven by a conscious or unconscious (‘routine-like’) decision to act. Given that the students were instructed to proceed as they themselves thought useful, this seems an appropriate definition of what we call ‘indicators of self-
regulation’. These indicators included verbal behaviour (e.g., ‘Uhm, I don’t know that anymore, I’m going to look that up in the text’) and nonverbal behaviour (e.g., watching the pictures in the newspaper article or using the dictionary).

The task approach was divided into three different stages. The first stage is orientation, in which readers focus on the purpose of the task and the topic of the text and select an approach for executing the task. The second stage concerns reading (substantial parts of) the text. The third stage is answering the questions either by relying on the text representation already obtained or by searching parts of the text specifically for the purpose of question answering. The stages prescribe no presumed sequence. It was for example possible to skip the first stage and even the second stage completely and start with answering the questions. Students quite often went back and forth between the stages of text reading and answering questions. In such cases, students returned to the text reading stage for several times.

The coding scheme was based on taxonomies of reading processes such as those of Coiro and Dobler (2007), Meijer et al. (2006) and Pressley and Afflerbach (1995). In addition, a pilot study was carried out among 10 low-achieving adolescent readers who did not participate in the present study to track down indicators of self-regulated activities that may occur in the assignment used. All indicators encountered were added to the coding scheme to assure a full coverage of all occurring self-regulated activities. First, all activities were coded in categories that described them as objectively as possible (Tables 1–3). Verbal activities were scored on the utterance level: each complete utterance was scored as one instance of an activity; nonverbal activities were scored as one complete instance. Second, to every single code, labels representing the aforementioned three stages were attached (‘orientation’, ‘text reading’ and ‘answering’). Finally, labels differentiating a few general categories within each of these stages were assigned (Tables 1–3). To enable a complete reconstruction of all sequences of activities, four codes were added to the scheme for actions that were not regarded as self-regulated. First, the code ‘silence’ was included for the moments in which students fell silent for more than 3 seconds. Second, the codes ‘reading text aloud’, ‘reading question aloud’ and ‘answering question aloud’ were added. By coding these ‘default activities’, it was possible to analyse when mere task execution was interrupted by self-regulatory activities. In addition, students’ reactions to the inconsistency were coded. Three reactions were distinguished: (1) reading on, (2) hesitation and (3) hesitation followed by a fix-up activity.

To determine inter-rater reliability, video recordings of 10 students (20%) were coded by two independent raters. In total, 80% of all indicators of self-regulation, silence, reading aloud and answering aloud were coded identically. This agreement is regarded as sufficiently high for the present purposes of analysis. All differences in coding were resolved after discussion.

Responses to the five questions were assigned points using sample answers prepared as a standard (Figure 1). Correct answers consisted of several aspects. For each correct aspect mentioned, students received points (a total of 12 possible points). All responses to the five questions were scored by two independent raters. The correlations between the scores of raters ranged from high to very high (q1 \( r = .69 \), q2 \( r = .76 \), q3 \( r = .71 \), q4 \( r = .94 \) and q5 \( r = .95 \)). The scores of raters were averaged and summed. Task achievement on average was 6.77 (\( SD = 1.96 \)). The highest score was 10 points; the lowest score was 2.5 points.

**Analysis**

Frequencies were computed for all indicators of self-regulated activities in the three stages of the task. Pearson correlations were computed to investigate the relationships between
the self-regulated activities and task achievement. Finally, in order to shed light on the sequences of the self-regulatory activities, activity sequences of the six students with the highest and lowest achievement scores were compared with each other and with six students with scores around the mean score. The task achievement scores of the three groups differed significantly from one another, $F(2, 17) = 305.95, p < .001$.

Results

Stage of orientation

We first examined the indicators of self-regulated activities observed in the stage of orientation. The frequency, range and mean of indicators coded in this stage are presented in Table 1.
Table 1 shows that the students demonstrated a variety of indicators of self-regulation in the orientation stage. From the 177 indicators in the orientation stage, 156 indicators were directed at the task, and 21 indicators were directed at the text. Apparently, the students

Table 2. Examples, frequency, range and means of self-regulatory indicators in the text reading stage (n = 51)

<table>
<thead>
<tr>
<th>Total indicators of self-regulation</th>
<th>Frequency</th>
<th>Range</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Text processing</td>
<td>638</td>
<td>0–39</td>
<td>12.3 (6.1)</td>
</tr>
<tr>
<td>2.1.1 Decoding</td>
<td>115</td>
<td>0–15</td>
<td>2.2 (2.8)</td>
</tr>
<tr>
<td>Rereading for decoding</td>
<td>108</td>
<td>0–14</td>
<td>2.1 (2.6)</td>
</tr>
<tr>
<td>Asking for help for decoding (e.g., (Al Qaida) ‘What is written here?’)</td>
<td>4</td>
<td>0–1</td>
<td>0.1 (0.3)</td>
</tr>
<tr>
<td>Asking for help with pronunciation (e.g., (Deh Rawood) ‘How do you pronounce this?’)</td>
<td>3</td>
<td>0–2</td>
<td>0.1 (0.3)</td>
</tr>
<tr>
<td>2.1.2 Comprehension</td>
<td>288</td>
<td>0–15</td>
<td>5.5 (3.0)</td>
</tr>
<tr>
<td>Reading the subheadings in the text</td>
<td>119</td>
<td>0–6</td>
<td>2.3 (1.0)</td>
</tr>
<tr>
<td>Taking a look at the illustrations</td>
<td>68</td>
<td>0–3</td>
<td>1.3 (1.3)</td>
</tr>
<tr>
<td>Reading the title</td>
<td>39</td>
<td>0–1</td>
<td>0.8 (0.4)</td>
</tr>
<tr>
<td>Indicating incomprehension of a word or phrase (e.g., ‘I do not understand this sentence.’)</td>
<td>24</td>
<td>0–5</td>
<td>0.5 (0.9)</td>
</tr>
<tr>
<td>Elaborating on the content (e.g., ‘…I think it is important that they return to Holland. I read that already 18 soldiers have died, I would not to take the risk…..’).)</td>
<td>10</td>
<td>0–5</td>
<td>0.2 (0.8)</td>
</tr>
<tr>
<td>Rereading for comprehension</td>
<td>8</td>
<td>0–1</td>
<td>0.2 (0.4)</td>
</tr>
<tr>
<td>Asking for help for comprehension (e.g., ‘What does “dilemma” mean?’)</td>
<td>6</td>
<td>0–2</td>
<td>0.1 (0.4)</td>
</tr>
<tr>
<td>Indicating comprehension of a word or phrase (e.g. ‘Oh, I see.’)</td>
<td>6</td>
<td>0–2</td>
<td>0.1 (0.5)</td>
</tr>
<tr>
<td>Paraphrasing a phrase (e.g., ‘Oh, so they only talk about Dutch soldiers.’)</td>
<td>6</td>
<td>0–2</td>
<td>0.1 (0.4)</td>
</tr>
<tr>
<td>Consulting the dictionary</td>
<td>2</td>
<td>0–1</td>
<td>0.0 (0.2)</td>
</tr>
<tr>
<td>2.1.3 Other text processing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rereading for which the purpose is unclear</td>
<td>235</td>
<td>0–11</td>
<td>4.5 (2.7)</td>
</tr>
<tr>
<td>2.2 Task execution</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switching to answering questions</td>
<td>43</td>
<td>0–5</td>
<td>0.8 (1.2)</td>
</tr>
<tr>
<td>Commenting on task execution (e.g., ‘Yes, this was it.’)</td>
<td>15</td>
<td>0–2</td>
<td>0.3 (0.6)</td>
</tr>
<tr>
<td>Asking for help (e.g., ‘Can I look this up in the dictionary?’)</td>
<td>10</td>
<td>0–2</td>
<td>0.2 (0.4)</td>
</tr>
<tr>
<td>Indicating incomprehension of the task (e.g., ‘Okay.’)</td>
<td>9</td>
<td>0–2</td>
<td>0.2 (0.5)</td>
</tr>
<tr>
<td>Indicating incomprehension of the task (e.g., ‘Huh, do I need to summarize it?’)</td>
<td>4</td>
<td>0–2</td>
<td>0.1 (0.3)</td>
</tr>
<tr>
<td>Commenting on the task (e.g., ‘Yawning.’)</td>
<td>2</td>
<td>0–1</td>
<td>0.0 (0.2)</td>
</tr>
<tr>
<td>Other activities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading text aloud</td>
<td>425</td>
<td>0–34</td>
<td>8.2 (5.6)</td>
</tr>
<tr>
<td>Silence</td>
<td>36</td>
<td>0–9</td>
<td>0.7 (1.5)</td>
</tr>
</tbody>
</table>
were orienting more frequently on the task than on the text. The most frequent indicator directed at task orientation was ‘skimming the task’. The frequency of skimming the task ranges from 0 to 1, meaning that at least one student did not show any indication of skimming the task, whereas at least one student did so once. The mean frequency of skimming the task equals .88, indicating that almost all students skimmed the task (46 of 51 students).

**Table 3. Examples, frequency, range and means of self-regulatory indicators in the answering questions stage (n = 51)**

<table>
<thead>
<tr>
<th>Total indicators of self-regulation</th>
<th>Frequency</th>
<th>Range</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Total indicators of self-regulation</td>
<td>301</td>
<td>0–19</td>
<td>5.9 (3.8)</td>
</tr>
<tr>
<td>3.1 Question comprehension</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rereading the comprehension questions</td>
<td>129</td>
<td>0–10</td>
<td>2.5 (2.4)</td>
</tr>
<tr>
<td>Reading the introduction to the task</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicating incomprehension of one of the questions (e.g., ‘What do they mean by this question?’)</td>
<td>19</td>
<td>0–2</td>
<td>0.4 (0.6)</td>
</tr>
<tr>
<td>Questioning the goal of the task</td>
<td>16</td>
<td>0–3</td>
<td>0.3 (0.6)</td>
</tr>
<tr>
<td>Asking for help for the benefit of comprehending the task (e.g., ‘Do I need to read the questions aloud?’)</td>
<td>15</td>
<td>0–3</td>
<td>0.3 (0.6)</td>
</tr>
<tr>
<td>Indicating incomprehension of the general goal of the task (e.g., ‘I have no idea what they want me to do.’)</td>
<td>8</td>
<td>0–3</td>
<td>0.2 (0.5)</td>
</tr>
<tr>
<td>Evaluating the task (e.g., ‘This is really difficult.’)</td>
<td>4</td>
<td>0–1</td>
<td>0.1 (0.3)</td>
</tr>
<tr>
<td>Restating the goal of the task (e.g., ‘So, I need to tell the answers to you.’)</td>
<td>2</td>
<td>0–2</td>
<td>0.0 (0.3)</td>
</tr>
<tr>
<td>3.2 Answering</td>
<td>172</td>
<td>0–9</td>
<td>3.3 (2.5)</td>
</tr>
<tr>
<td>Consulting parts of the text to search the relevant answer</td>
<td>62</td>
<td>0–5</td>
<td>1.2 (1.2)</td>
</tr>
<tr>
<td>Indicating not knowing the answer to one of the questions (e.g., ‘I do not know the answers straight away, I need to find in the text.’)</td>
<td>44</td>
<td>0–4</td>
<td>0.9 (1.0)</td>
</tr>
<tr>
<td>Switching over to reading parts of the text for the first time</td>
<td>17</td>
<td>0–2</td>
<td>0.3 (0.7)</td>
</tr>
<tr>
<td>Indicating to know the answer to one of the questions (e.g., ‘I do not know the answer yet.’)</td>
<td>9</td>
<td>0–2</td>
<td>0.2 (0.5)</td>
</tr>
<tr>
<td>Evaluating the process of answering the questions</td>
<td>9</td>
<td>0–2</td>
<td>0.2 (0.4)</td>
</tr>
<tr>
<td>Generating the answer to one of the questions (e.g., ‘Let me see … uhmmm the text is about a country named Afghanistan …’)</td>
<td>8</td>
<td>0–3</td>
<td>0.2 (0.5)</td>
</tr>
<tr>
<td>Taking a look at one of the illustrations in the text</td>
<td>8</td>
<td>0–3</td>
<td>0.2 (0.5)</td>
</tr>
<tr>
<td>Consulting the dictionary</td>
<td>7</td>
<td>0–2</td>
<td>0.1 (0.4)</td>
</tr>
<tr>
<td>Checking whether the answer is correct in the text</td>
<td>3</td>
<td>0–1</td>
<td>0.1 (0.2)</td>
</tr>
<tr>
<td>Activating prior knowledge (e.g., ‘Al Quida is that terrorist group.’)</td>
<td>2</td>
<td>0–1</td>
<td>0.0 (0.2)</td>
</tr>
<tr>
<td>Evaluating the content of the text (e.g., ‘In that case, the text makes no sense anymore.’)</td>
<td>1</td>
<td>0–1</td>
<td>0.0 (0.1)</td>
</tr>
<tr>
<td>Other activities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silence</td>
<td>38</td>
<td>0–4</td>
<td>0.7 (1.1)</td>
</tr>
<tr>
<td>Reading question aloud</td>
<td>255</td>
<td>0–8</td>
<td>4.9 (1.2)</td>
</tr>
<tr>
<td>Answering question aloud</td>
<td>317</td>
<td>4–11</td>
<td>6.1 (1.6)</td>
</tr>
</tbody>
</table>

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Other frequent activities were ‘reading the comprehension questions’, ‘questioning the goal of the task’ and ‘reading the introduction to the task’. Less frequent were indicators that students reflected on their task approach (such as ‘planning task approach’, ‘restating the goal’, ‘asking for help or confirmation’). Table 1 shows relatively few indicators that students oriented on the text by reading the title and subheadings or looking at the illustrations in the text. There were also few indicators of students’ activating prior knowledge about the topic of the text.

Stage of text reading

Table 2 shows descriptive statistics for indicators of self-regulation observed in addition to episodes in which students fell silent or were reading aloud in the stage of text reading. This stage was coded from the moment when students started reading the first sentence of the text.

Table 2 shows a variety of indicators with large differences in frequency. By far, most of the 681 indicators were directed to text processing (638) and to a much lesser extent to task execution (43). The text-processing indicators consisted a substantial part of rereading activities (351). At the same time, the ranges of the rereading activities reveal large differences among this group of low-achieving adolescents. For one third of the rereading activities, we were able to discern their purpose on the basis of students’ verbalisations: decoding (108) or comprehension (8). Decoding was coded, when it was obvious that students were having trouble with word recognition (e.g., when reading unknown words such as Deh Rawood or Tarin Kowt). Comprehension was coded when students did not seem to understand the passage chosen for rereading (when word recognition did not seem to be a problem). However, two thirds of the rereading activities could not be interpreted as belonging to each of the two purposes and were therefore coded separately. Other frequent text-processing indicators involving comprehension were ‘reading the subheadings in the text’ (119), ‘taking a look at the illustrations’ (68), ‘reading the title’ (39) and ‘indicating incomprehension of a word or phrase’ (24). These activities point to students’ efforts in gaining access to the text and point to efforts in achieving text comprehension. To a lesser extent, indicators were observed that were more clearly directed at the construction of a situation model of the text, such as ‘elaborating on the content of the text’ (10), ‘rereading for the benefit of comprehension’ (8) and ‘paraphrasing a phrase’ (6). Indicators of activities observed in studies with more proficient readers, such as predicting, inferring, summarising and self-questioning, were not encountered in our data. Next to text processing, it was observed that other aspects of task execution were carried out during the stage of text reading. The most frequent indicator of this type was ‘switching to answering the questions’ (15). This activity was demonstrated by students who interrupted their text reading to answer questions. In addition, some students commented on their own task execution (10) or asked for help (9).

Students’ response to the inconsistency included in the text provides information about comprehension monitoring among low-achieving adolescents. We found that almost half of the students (24 out of 51 students) did not seem to notice the inconsistency because they read on without noticeable hesitation, such as silence or hesitation. About one third (16 out of 51 students) seemed to notice something because they hesitated but showed no indications of subsequent self-regulation by means of rereading, pausing or asking for help. However, one fifth of the students (11 out of 51) explicitly noticed the
contradiction (e.g., ‘Huh? I do not understand this sentence. It says that the Americans would appreciate another attack. This is not true.’) and applied a so-called ‘fix-up activity’ by means of rereading or asking for help from the experimenter. Thus, a minority of low-achieving adolescent readers checked whether their interpretation of this passage was in line with their prior knowledge.

Stage of answering questions

Table 3 shows descriptive statistics for all indicators of self-regulation observed in the stage of answering questions, coded from the moment when students started answering one of the questions.

In the answering questions stage, 19 different types of self-regulation were observed. From the 301 indicators, 129 indicators involved the comprehension of the questions, and 172 indicators involved the answering of these questions. The most frequent indicators of question comprehension were ‘rereading the questions’ (22), ‘reading the introduction to the task’ (20), ‘indicating incomprehension of one of the questions’ (19) and ‘questioning the goal of the task’ (16). That some students signalled not comprehending one of the questions indicates that they had difficulties integrating the propositions within the questions with information provided in the text. This suggests they had difficulty with text comprehension and the construction of a situation model as well. In regard to answering the questions, Table 3 shows that ‘consulting parts of the text to search the relevant answer’ (62) and ‘indicating not knowing the answer to one of the questions’ (44) were much more frequent than the other types of indicators. The means indicate that on average every student searched the text to search for answers and that almost all students gave indications of not knowing an answer to one of the questions at least once. The ranges indicate, however, that there were quite some differences between the students. For example, at least one student did not return to the text at all while answering the questions, whereas one student did so five times. Furthermore, it was found that some students switched to text reading in the stage of answering the questions 17 times. This was observed with students who did not read the text from beginning to end but interrupted their text reading for answering one of the questions.

Relationships with task achievement

First, we calculated Pearson correlations between the time on task during the three main stages of task execution, total execution time and task achievement. Results show that none of the time variables (orientation, text reading, answering questions and total time) were significantly related to task achievement (−.03, .19, .03 and .16, respectively; \( p > .19 \)). In order to answer the second research question, Pearson correlations were computed between task achievement (the total score for answers on the comprehension questions) and the frequencies of the main self-regulatory categories. The results are reported in Table 4.

The results in Table 4 show that low-achieving adolescents that were more active in self-regulation of any type (the total of all indicators) did not demonstrate better task performance. On the other hand, activities involving comprehension during text processing are positively associated with task performance (\( r = .329, p = .017 \)). The more frequent low-achieving adolescents were directed at text comprehension, indicating active processing of
text contents, the better were their answers to the questions. In addition, a negative correlation is found between the frequency of activities directed to task execution in the stage of text reading and task performance ($r = -0.325, p = 0.019$). Apparently, the more low-achieving adolescents paid attention to task execution during reading, such as frequent switches from reading to answering questions, the poorer were their answers to the questions. Finally, for the other main types of self-regulation in the stages of orientation, text reading and answering questions, the correlations with task achievement are not significant.

**Sequences of self-regulated reading**

In order to shed light on the sequential patterns of the self-regulatory reading activities of low-achieving adolescents (third research question), the patterns in the stage of orientation and answering questions of 18 students who obtained the highest (six best achievers), average (six average achievers) and lowest scores for their answers (six lowest achievers) are visualised in Figure 3. In the figure, the transition between the different stages for each individual student is indicated by a bold vertical line. The activities displayed during text reading are not incorporated in this figure but analysed separately (Figure 4). Text reading is marked with R-blocks. When more than one R-block is present, students switched between the stages of text reading and answering questions.

Figure 3 shows a distinct difference between the sequences in which the lowest-achieving students passed through the reading task compared with the others. The best-achieving and average-achieving students showed a comparable sequential pattern. They performed some orientation activities (O-blocks), after which they read the text from beginning to end (R-blocks). Finally, they answered the questions one by one (A-block and Q-block). When they did not comprehend the questions (Q?-blocks) or did not know the answer (A?-blocks), these students applied strategies that enabled them to continue executing the task. Only best-achieving Megan and average-achieving Robby deviated

<table>
<thead>
<tr>
<th>Table 4. Correlations of indicators of self-regulation with task achievement ($n = 51$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task achievement</td>
</tr>
<tr>
<td>Total of all indicators of self-regulation</td>
</tr>
<tr>
<td>1. Orientation</td>
</tr>
<tr>
<td>1.1. Task orientation</td>
</tr>
<tr>
<td>1.2 Text orientation</td>
</tr>
<tr>
<td>2. Text reading</td>
</tr>
<tr>
<td>2.1 Text processing</td>
</tr>
<tr>
<td>2.1.1 Decoding</td>
</tr>
<tr>
<td>2.1.2 Comprehension</td>
</tr>
<tr>
<td>2.1.3 Other text processing</td>
</tr>
<tr>
<td>2.2. Task execution</td>
</tr>
<tr>
<td>3. Answering questions</td>
</tr>
<tr>
<td>3.1 Question comprehension</td>
</tr>
<tr>
<td>3.2 Answering</td>
</tr>
</tbody>
</table>

*Significant at .05.
Figure 3. Sequences of self-regulated activities in the orientation stage and in the answering questions stage of 18 students who obtained the highest, average and lowest achievement scores.
from this general sequential pattern by not reading the text in one episode. Megan, for example, started reading without any indication of orientation and interrupted her text reading for answering the questions. However, she reconsidered and adapted her task approach as soon as she found out that she couldn’t answer the questions yet (‘Actually, I do not know the answer yet’). The sequential pattern of the task approach of the six lowest-achieving students is quite different from that of most other students in Figure 3. Except for Brandon, all lowest achievers alternate several times between text reading (R-blocks) and answering questions (A-block and Q-block). Although this is not necessarily a bad strategic approach in general, it requires quite some control over the task requirements and a good situation model of the text to switch at the right moments. In the absence of such control and text representation, these frequent switches between text reading and answering questions may have had a detrimental effect on task achievement.

Regarding the indicators of self-regulation involving orientation (O-blocks), Figure 3 shows that the self-regulatory patterns of the best, average and low achievers did not differ much in terms of frequency. All groups included students demonstrating few (e.g., Megan, Kayla and Johnny) and many self-regulatory activities during orientation (e.g., Sahar, Alicia and Munira). In regard to the nature of the activities, some differences were found, however. Four of the six low achievers were only skimming the task (OS-blocks), while most average and best achievers also read the introduction to the task (OI-block) and/or the questions (OR-block). It is possible that reading these parts directed the better-achieving students to their more straightforward approach of the task, sketched earlier. In the introduction, students were told to use the text, and in the first question, students are asked to tell what the text is about. Students who did not read these parts of the task missed these hints.

With regard to question comprehension (the Q-blocks), Figure 3 shows that the lowest achievers showed more indicators of self-regulation concerning question comprehension (19 Q-blocks) than the average (12 Q-blocks) and best achievers (8 Q-blocks). A closer
look at the protocols showed that many of these indicators arose because the lowest-achieving students had difficulty with relating questions to the text contents. Johnny, Sara and Brandon, for example, had not read parts of the text to which the questions referred to. Consequently, they were not able to match the questions with their situation model of the text (e.g., Sara: ‘Uhm, I do not understand this question. I suppose I need to read on.’). They tried to solve this by switching to text reading (Johnny and Sara) or asking for help (Brandon). The best-achieving students had fewer indicators dealing with this type of difficulty. For example, the self-regulatory activities concerning question comprehension of Zeno, Daan and Alicia involved careful reading of the questions and understanding of what they were supposed to do (e.g., Daan: ‘Am I supposed to answer the question orally to you?’).

Regarding the A-blocks, Figure 3 reveals few differences between the different groups. In all groups, students gave indications of not knowing the answer to questions (A?-blocks), and in most cases, they consulted specific parts of the text to search for relevant information (AS-blocks) or read parts of the text they did not read before (R-blocks). A closer look at the protocols revealed that most of the best-achieving and average-achieving students succeeded quite well in finding answers, because they knew where to find relevant information, presumably as a result of a more complete situation model of the text.

Finally, the self-regulatory activities in the text reading stage (R-blocks) were compared for the three groups. Because the results of the correlational analyses showed significant relations of regulation involving text processing directed at comprehension (2.1.2) and task execution (2.2) with task achievement, it is focused on these aspects. Figure 4 represents how the activities performed during text reading were divided over the main categories (left pie) and were divided over the different types of text comprehension activities (right pie). The histogram shows how the activities were divided over the different types of task execution activities.

Figure 4 shows that the best-achieving and average-achieving students’ indicators of text processing directed at comprehension differed from those of the lowest-achieving students. A larger proportion of the activities performed by these students during text reading were directed at text comprehension, 27% and 22%, respectively, as opposed to 11%. Moreover, the profiles of the best-achieving and average-achieving students show more variation in the type of activities used for regulating text comprehension. Finally, the best-achieving students showed more indications of comprehension and incomprehension than the average-achieving and low-achieving students. Together, this suggests that the best-achieving and average-achieving students monitored their text comprehension more actively compared with the low-achieving students, which probably resulted in better task achievement. For task execution, Figure 4 shows that the best and average achievers show fewer switches between text reading and answering the questions than the lowest-scoring students. These findings suggest that the decision of these low-achieving students to start answering questions before the completion of text reading may have had a negative impact on their task performance.

**Discussion and conclusions**

The objective of this study was to determine types and sequences of self-regulation activities in task-oriented reading of low-achieving adolescents and to relate these to the quality of their task performance. It was found that low-achieving adolescents carried out several types of self-regulatory activities during three stages of task-oriented reading.
A large majority of the readers performed task orientation activities. Most of these activities were directed at the task (skimming, reading the questions, questioning the goal, etc.). A few were directed to the text (activating prior knowledge and looking at illustrations or at headings). The findings with regard to self-regulation in the stage of text reading concur with what can be expected from the literature about differences between poor and more proficient adolescent readers (Biancarosa & Snow, 2006; Cataldo & Oakhill, 2000; Cerdán & Vidal-Abarca, 2008; Pearson et al., 1992; Pressley, 2000; Oakhill & Cain, 2007). Most self-regulation activities during text reading were directed at constructing a textbase and to a much lesser extent at text comprehension directed at constructing a situation model (Kintsch & Kintsch, 2005). Indications of self-regulation found in analyses of more proficient readers, such as predicting, inferring, summarising and self-questioning, were completely absent in the behaviour of the readers observed in this study. In the stage of answering questions, students showed various indications of monitoring comprehension of the questions and regulating the answering process. When questions were not understood or when students were not able to answer the questions, they returned to the text to search for answers, reading parts of the text again or asked for help.

Although the results point towards the existing image of low-achieving adolescent readers being mainly oriented towards building a textbase, support was also found for the expectation that there are relevant differences in regard to self-regulation within the group of adolescent low-achieving readers (Biancarosa & Snow, 2006; Rapp et al., 2007). Differences in frequency of self-regulated activities in the stage of text reading were related to task achievement, whereas those directed at task orientation and answering questions were not. In other words, the difference in reading task performance among adolescent low achievers was determined in the text reading stage and not in the other two stages of task-oriented reading. More specifically, students showing more indications for regulating their text comprehension obtained higher task achievement scores, whereas students who paid more attention to task execution during text reading obtained lower scores. These results are important, because they suggest that, although most adolescent low achievers mainly focus on creating a textbase, self-regulation directed to comprehension and the creation of a useful situation model for task achievement is within the reach of at least some of them. In addition, when confronted with an inconsistency, about one fifth of the low-achieving readers applied self-regulatory activities directed at monitoring their comprehension. Furthermore, these findings suggest that successful task achievement of low-achieving adolescents is characterised by knowing when to execute certain types of self-regulatory actions, rather than applying self-regulatory activities frequently. This interpretation is additionally supported by our finding that time on task spent by the students was not significantly related to task achievement. This means that time spent on the task is not decisive for task achievement, whereas types of self-regulatory activities and sequential patterns are.

A close look at the sequential nature of self-regulatory patterns of the best-achieving, average-achieving and lowest-achieving students in our sample provided a better understanding of their relationship with task achievement. The best-achieving and average-achieving students in the group of low-achieving readers showed a sequential pattern that can be characterised as follows. They performed task orientation activities first, after which they read the complete text from beginning to end and finally answered the questions one by one. In contrast, the lowest achievers in the sample started with task orientation as well but subsequently alternated between the stages of text reading and answering the questions. These different patterns point to a difference in approach of the task: whereas the low-achieving readers who received higher achievement scores interpreted the assignment as
directing them to read the complete text, the lowest achievers were more inclined to jump to the questions as soon as possible. Therefore, these students interrupted text reading for reading and answering the comprehension questions several times. These interruptions probably inhibited the construction of a situation model and therefore impeded task achievement. By their more straightforward approach, the best-achieving and average-achieving participants were able to build a more complete situation model and therefore faced fewer difficulties in understanding and answering the questions. Thus, although the frequency of task orientation activities was not related to task achievement in the correlation analyses, the sequential analyses point to the importance of the type of self-regulated activities performed in this stage of task-oriented reading. This example shows that differences in reading task achievement of low-achieving adolescents are better explained by considering types and sequences than by mere frequency of self-regulatory activities.

In their attempt to characterise reading processes and text comprehension of readers of diverging proficiency, Alexander and Murphy (1998) distinguished the following reader profiles: highly competent, seriously challenged, resistant, effortful and nonstrategic. From the findings, it can be concluded that readers in this study with the best and average task performance had some characteristics of effortful processors. Although reading was difficult for them, these readers managed to formulate satisfactory answers to the questions posed. In addition, their self-regulation focused not only on forming a textbase but also on attempting to relate the text to their prior knowledge. This was demonstrated by their attempts to monitor their comprehension and to repair problems when encountered. In contrast, the readers with the poorest task performance have some of the characteristics of nonstrategic processors, because they demonstrated significantly fewer comprehension-related activities in the text reading stage. In addition, compared with the best-performing and average-performing students, they showed an ineffective task approach, resulting in insufficient text comprehension to find satisfactory answers to the questions posed.

In contrast to the image arising from studies comparing low-achieving with proficient adolescent readers, the results of this study support the idea that within the group of low-achieving adolescents, there are important differences in self-regulatory activities. Some of these low-achieving readers put effort in comprehension monitoring and giving meaning to text contents by relating them to prior knowledge about the topic, whereas others do not show signs of such construction of a situation model of the text. In addition, the low-achieving adolescents in the first group were more likely to receive high scores for task achievement than their peers. This suggests that even for low-achieving adolescents who have to rely on limited resources for reading (such as genre knowledge, topic knowledge, linguistic knowledge, reading fluency and metacognitive knowledge), active self-regulation of comprehension-directed processes is effective. Whether we can discern different ‘profiles’ of low-achieving adolescent readers and to what extent the observed differences are task-specific manifestations of self-regulatory activity, dependent on motivation, prior knowledge or other contextual factors, cannot be determined on the basis of this study, however, but should be subject of future investigations.

Notwithstanding the differences found, the repertoire of self-regulative activities for adolescent low-achieving readers turned out to be limited. Strategies directed at text comprehension that are often reported for more proficient readers, such as predicting, inferring, summarising and self-questioning, were not found in the analysis. In addition, several approaches taken by these low-achieving adolescents, especially interrupted reading of text and jumping into the questions, turned out to be ineffective. Although the specific reading task in this study did not contain concrete rewards for the students to show high task
achievement, it is not believed that this influenced the results in a significant way. First, the students in general appeared quite motivated in performing the reading task in front of an encouraging and motivating researcher. The students also knew the researcher well, because they were involved in a broader (longitudinal) study in which she had collected data from them for more than a year. Therefore, students felt quite at ease and were not shy in expressing their thoughts during task execution. In addition, few self-regulatory activities directed to constructing a situation model of the text are reported in other studies of the reading process of low-achieving adolescents as well (Chambers Cantrell et al., 2010; Graesser, 2007). Consequently, it is assumed that the low frequency of indications of predicting, inferring, summarising and self-questioning is a valid characteristic of these students’ approach to task-oriented reading.

There is ample reason to stress the importance of teaching self-regulatory strategies to adolescent low-achieving readers. Several studies indicate that instruction directed at self-regulation of reading can enhance reading skill (Chambers Cantrell et al., 2010; Edmonds et al., 2009; Mason, 2004; Paris, Wasik & Turner, 1991; Pressley, 2000). Emphasis on self-regulatory skills for reading education to low-achieving adolescents is warranted. A focus on self-regulation directed at text comprehension (paraphrasing, making inferences, comprehension monitoring, self-questioning and summarising) seems particularly promising for these students. Instruction directed at task orientation and planning an orderly task approach also seems to be promising. For example, teaching students to pay careful attention to the assignment in its entirety before starting to read the text may help low-achieving adolescents to adopt a more successful task approach. Because reading tasks for adolescents become increasingly long and complex, students should also become familiarised with activities such as scanning, determining importance and coordinating multiple text sources. In addition, it is not always efficient to read texts from beginning to end. It was observed that some low-achieving adolescents in this study took a different approach to the reading task, alternating text reading and answering of questions. This indicates that they attempted a task approach unsuitable to their level of knowledge and skills. Nevertheless, they may be ready for instruction directed at strategic task approaches, in which they have to consider their own limited resources in the context of the demands posed by the reading task. Cerdán et al. (2009) suggest that an approach not based on reading the whole text in advance may be successful in the case of ‘low-level’ questions (requiring not more than a search and locate strategy) but is probably not advisable in the case of ‘high-level’ questions, such as the interpretation and reflection questions we used in our experimental reading task, because it delimits students ability in forming an adequate situation model. Instruction may therefore acquaint students to these ‘levels’ of understanding that different questions require and their consequences for strategic approaches of task-oriented reading.

In addition, several scholars suggest embedding such strategy instruction in the context of content-area teaching (Biancarosa & Snow, 2006; Duke & Pearson, 2002; Graesser, 2007; Guthrie & Wigfield, 1997; Kamil et al., 2008; Palincsar & Herrenkohl, 2002).

Finally, we recognise that this study has limitations. The self-regulatory activities were analysed using one specific reading task. Therefore, it is not known to what degree the approaches taken by the students were task specific or more generalisable. It is, for example, possible that the best-achieving students in this study would not be as successful when confronted with reading tasks making a different appeal on their (prior) knowledge, linguistic knowledge or motivation to succeed. Future studies will have to clarify what roles low-achieving adolescents’ topic and vocabulary knowledge and personal interests play in the type of self-regulatory activities they engage in while executing reading tasks. It seems
plausible that reading tasks make different appeals on these adolescents, dependent on how much they know about the background and how far they are interested in the contents. In addition, we have no insight in the influence think-aloud procedures might have on low-achieving students’ task achievement. In future studies, a comparison with reading task achievement of students with and without think-aloud instruction must inform us whether verbalising thought is likely to influence the quality of their performance. Nevertheless, we believe that the in-depth exploration of the types and sequences of self-regulated activities in this study has added valuable information to the body of research into reading processes of low-achieving adolescents.

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