Factors affecting the recreation of a story from a text; A cross-cultural experiment

Abderrahman El Aissati & Mia Stokmans
Department of Culture Studies, Tilburg University
A.elAissati@uvt.nl; M.J.W.Stokmans@uvt.nl

In this research, we regard a text as a written expression about an extraordinary experience in which the socio-economic, cultural and historical background of an author affects the way this experience is translated into a text that tells the story. From this perspective, the task of a reader is to recreate the story embedded in a written text. A central question that pops up is to what extent a (mis)match between the background of a story and a reader affects the recreation process. This question can be framed within information processing theories that indicate that a recreation process is affected by motivation and ability to read this text. Furthermore, a mismatch affects the ability (conceptualized within schema theory) to recreate a story negatively.

In order to investigate this thesis, we conducted a cross-cultural study (Netherlands, Russia, Morocco) in which each student read one of three short real texts (random assignment) concerning a World War II story situated in the following geographic areas: The Netherlands, Russia and Morocco. Afterwards they filled in a reading comprehension test and a questionnaire about reading motivation, and ability to recreate the story.

The results indicate that reading motivation affects reading comprehension positively. Reading ability (formal schema and content schema) affects comprehension in a complex way: some aspects affect basic levels of comprehension while others affect advanced levels of comprehension. Furthermore, the results reveal a consistent interaction effect between text and geographic area of a respondent. However, no evidence is found for the hypothesis that a match between background of a story and a reader results in higher comprehension scores.

1. Introduction

Texts play an important role in communication between people. They are used to inform potential readers and to spread experiences, ideas and opinions about (daily) life. Texts might be factual or fictitious. Texts or (fictitious) stories can be seen as a

communicative process (McCarthy et al., 2004): An author has an extraordinary experience, an idea or vision to be communicated. This idea is conceptualized in a text, and transmitted to potential readers, in digital form (online) or in print. These read the text and make an interpretation of it (see figure 1).

This framework suggests that an author has to conceptualise an experience, or a vision into a textual expression. The way the experience is perceived, remembered, and translated into a text is affected by the (socio-)cultural and historical background of the writer (Rader, 1961; Csikszentmihalyi, 1997; Welty, 2002). We believe that an author assumes (implicitly) that there is a common realm of understanding (Fill, 2002). Readers are believed to construct their meaning of a text by active, interactive, and recursive processing of information that is available in the text as well as triggered by associations from memory (Anderson, 1999; Grabe & Stoller, 2002). This recreation process links a text (as a product, see also Noordman & Maes, 1993) to an interpretation of a text by making use of procedural knowledge (reading skills) and semantic and episodic knowledge (such as background knowledge) that are often conceptualized as reading literacy (Mullis et al., 2006; OECD, 2014). Moreover, it is assumed that the recreation of a story from a text costs effort. Therewith the recreation process is also influenced by the willingness to process information. In information processing models, this willingness is conceptualized as motivation (Petty & Cacioppo, 1986; O'Keefe, 1990).
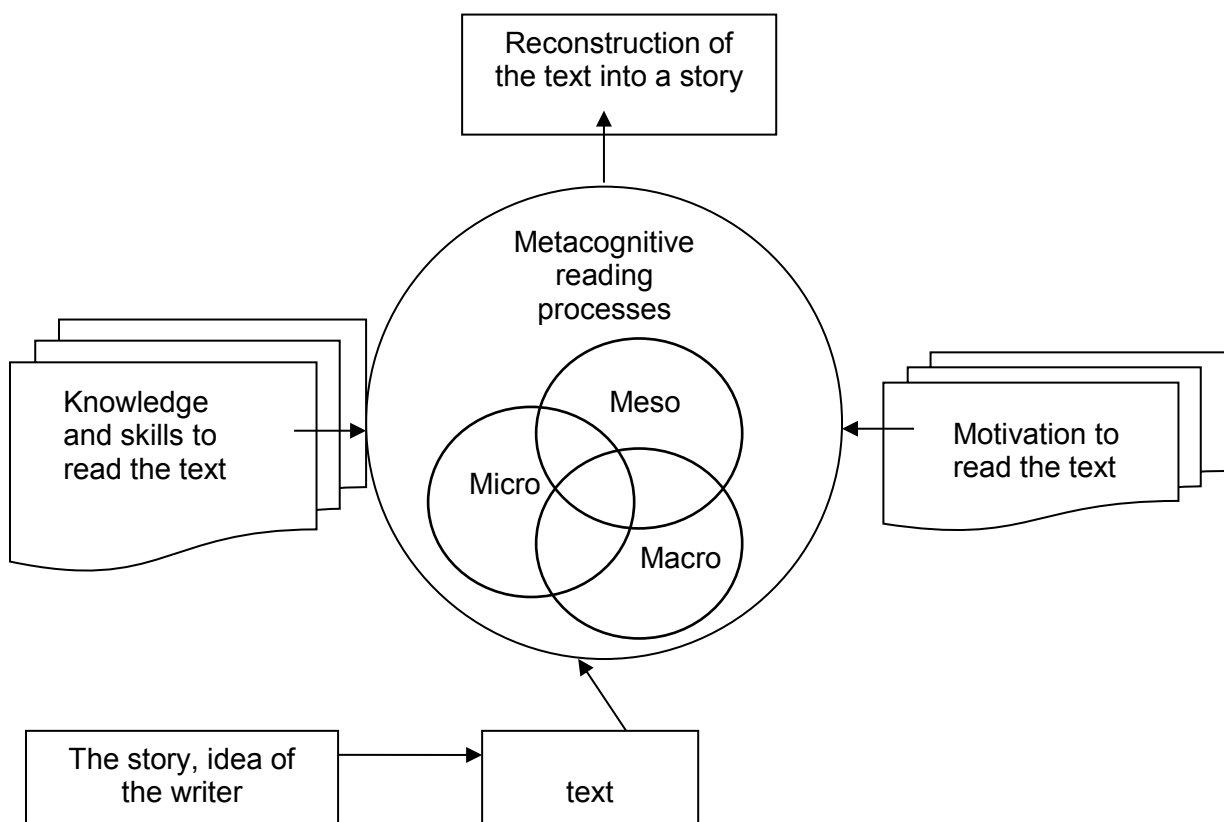

Figure 1: Reading as a recreation process

This line of reasoning suggests that a (mis)match between the backgrounds of a story and a reader affects the recreation process. In the present research we address the issue of mismatch, by looking at its effect on reading comprehension of a text. First, we will frame the issue at hand within information processing theories to make it more precise.

Reading as information processing
Reading and interpreting a text is a complex process that is influenced by several factors. In order to come to a framework to study reading processes, we start from a semiotic and social constructivist viewpoint (Vygotsky, 1987; Wilkinson & Silliman, 2000; Painter, 2001). This perspective postulates that individuals construct their unique understanding of the world by experiencing, evaluating and incorporating the interpretations of a text into their personal world view. From this perspective, meaning is not necessarily expressed directly in a text but constructed by a reader by active (reading), recursive (creation and recreation), and interactive (discussing) processes (Anderson, 1999; Grabe & Stoller, 2002).
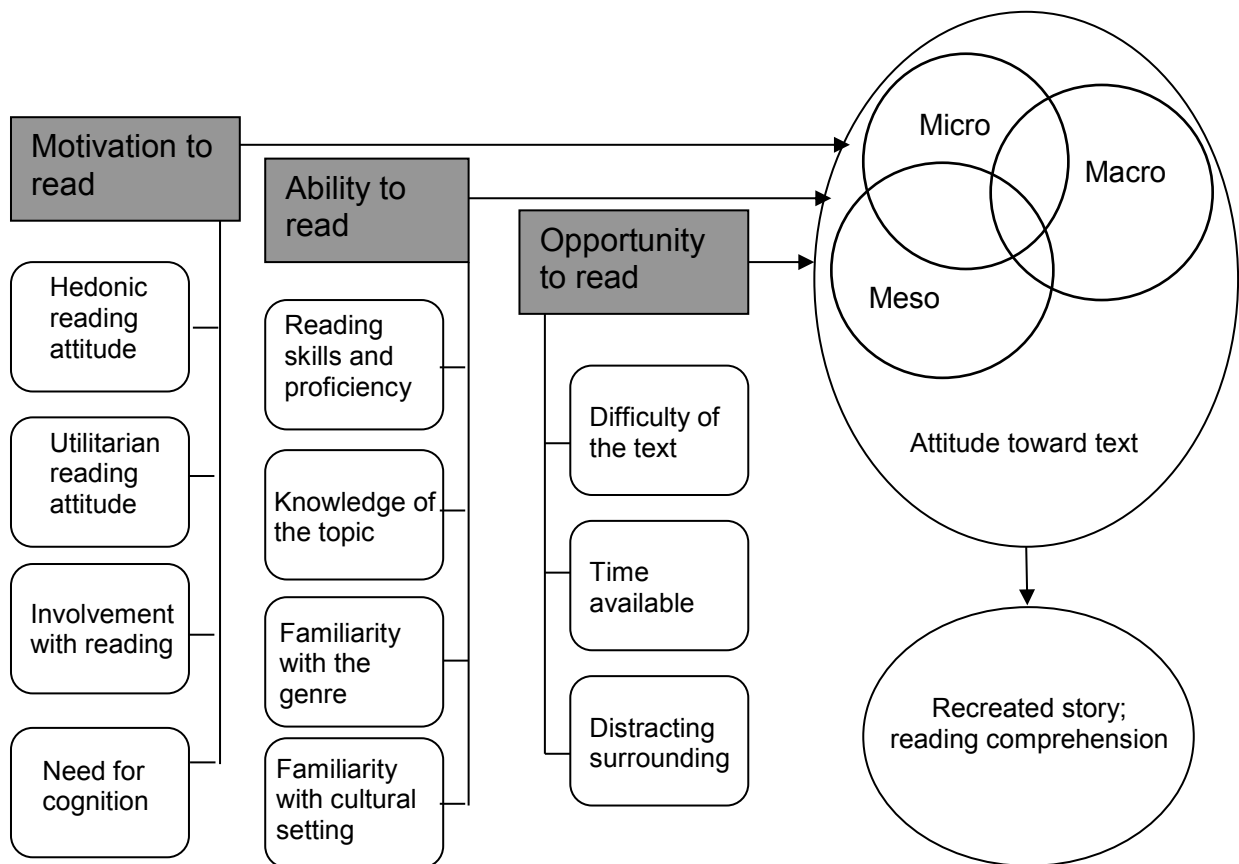

Figure 2: Factors affecting the recreation of a text into a story (based on the MAO-model of MacInnis & Jaworski, 1989)

Reading a text has many similarities to information processing in order to get informed or to come to an opinion about a topic. In this paper, we make use of dual-process theories that combine a fast associative information processing mode with an

elaborative information processing mode (Chaiken & Trope, 1999: preface). These dual-process theories can account for differences in knowledge, skills, and motivation which are important antecedents for the comprehension of a text. In this study, we lean heavily on the MAO-model of MacInnis & Jaworsky (1989), using it as a general framework to describe the important antecedents of reading processes (see Figure 2 above).

Although we lean heavily on the global structure of the MAO-model, we believe that the model should be modified to make it more applicable for studying reading behavior. We will start by describing the three hypothetical constructs of the MAO-model adapted to the context of reading a cultural (un)familiar text and then turn to the question how unfamiliarity with the setting of a story can affect the comprehension of a text.

1.1 Antecedents of the reading process: motivation, ability, and opportunity

Motivation to read
The motivation to read a (specific) text is defined as the desire to process information in the text (parallel to MacInnis & Jaworsky, 1989). This definition is more specific than reading motivation as operationalized in the 'motivation for reading questionnaire' (MRQ, see Wigfield, 1997; Wigfield & Gutrie, 1997; Baker & Wigfield, 1999). In that questionnaire reading motivation is defined as: ".. what activates behavior" (Guthrie & Wigfield, 2000). In general, it is assumed that motivation is characterized by an intensity and direction. The intensity describes the amount of processing capacity and working memory allocated to a task. So the more motivated a person is to read a text, the more effort will be made to process a text. In dual-process models, it is generally assumed that the higher the motivation, the more a reader will make use of an elaborate information processing mode (inference making) (Petty & Caccioppo, 1986; MacInnis & Jaworsky, 1989).

The direction of the motivation affects, on the one hand, what information in a text is entering the reading process. On the other hand it affects what kind of extratextual information is used to make inferences to create a (personal) meaning of a text. So it affects what paragraphs are regarded as (most) interesting, as well as the kind of associations and elaborations made on the basis of the text.

According to figure 2, motivation to read is in itself influenced by reading attitude, involvement with reading, and need for cognition (Petty & Cacioppo, 1986). These concepts will be discussed successively. A person's <u>reading attitude</u> is conceptualized as a learned predisposition to react consistently favorably or unfavorably to the activity of 'reading storybooks' (Fishbein & Ajzen, 1975; Broeder & Stokmans, 2013). A key characteristic of attitudes is that they are based on experiences with the attitude object, in this case reading storybooks (Zanna & Rempel, 2008; Gawronski & Bodenhausen, 2007). These experiences are, among other things, affected by primary and secondary reading socialization.

Studies on reading attitude (McKenna et al., 1995; Mullis et al., 2006) regard an attitude as a one-dimensional construct that focuses mainly on the (instrumental) benefits associated with reading. However, leisure reading is also a type of hedonic behavior (Holbrook & Hirschman, 1982). So, two different components of reading attitude will be distinguished (Breckler & Wiggins, 1989; Batra & Athola, 1990; Voss et al., 2003): a hedonic component referring to emotions and feelings immediately experienced while reading, and an instrumental, utilitarian component that relates to the (instrumental) benefits attached to reading.

Involvement with reading is conceptualized in correspondence with the cognitive approach (Laaksonen, 1994) and it regards the personal relevance of the benefits attached to the act of reading (Zaichkowsky, 1984; Peter & Olson, 1987). Due to this perspective, involvement is related to the attitude construct in that they are both aspects of the memory structure concerning reading (Peter & Olson, 1987; Laaksonen, 1994). Attitude regards the content of the beliefs (to what extent is a believed benefit associated with reading); involvement concerns the centrality of the belief about reading (how important is this believed benefit for my self concept).

Need for cognition is of special interest since reading is a cognitive task. It denotes a general tendency to engage in and enjoy effortful cognitive endeavours (Cacioppo & Petty, 1982). People who score high on need for cognition are generally more motivated to do effortful or complex tasks (Cacioppo et al, 1996) and will, therefore, perform higher order metacognitive reading processes more often.

Moreover, one should realise that, while reading a text, motivation can be altered due to the interestingness and pleasantness of the story (Kahneman, 1973; 2012; Matheuwson, 1994). An interesting story absorbs a reader and provides the reading process with (extra) energy to keep on going. A difficult or dull story has the opposite effect. These feelings are experienced while reading this story and can be captured in an attitude toward the text. Parallel to our description of reading attitude, we distinguish a hedonic (pleasant) and an instrumental (useful) factor in an attitude towards a text.

Ability to read

Ability to read is defined as having the skills or proficiency to process the information in the text (MacInnis & Jaworsky, 1989). It regards skills, proficiency, and knowledge a person can invest to recreate a text into a story. In PISA studies (OECD, 2014), these assets are referred to as reading literacy, that is defined as the "..capacity to retrieve specific information from written texts, on whether they [readers] could understand and interpret what they had read, and on how well they could reflect on and evaluate the content and form of the material" (Stanat et al., 2002: 5). In our framework, this capacity is called ability to read and includes reading proficiency next to all kinds of extratextual knowledge that facilitates the recreation of a story.

Reading proficiency will be linked to three different discourse levels (Kintsch & van Dijk, 1978; Berhnardt, 1991), micro, meso, and macro, and is conceptualized

parallel to the metacognitive reading skills distinguished in the PIRLS study (Mullis et al, 2006: 3):
1. Finding the information explicitly given
2. Making straightforward inferences
3. Interpreting and integrating ideas and information
4. Determining the type of text (purpose of the text) and adjusting the interpretation of the text accordingly.

The first level focuses on the information signified in the text. What is the story about, and what is being said about it? A reader can recognize the intended information in the text. Questions that can be answered at this level of comprehension are: who does what, where and when? This skill is based on vocabulary and meaning analysis (MacInnis & Jaworsky, 1989) at a sentence level. It focuses on micro-level processes.

The second level corresponds to meso-level processes since it not only regards essential information in a particular sentence of a text, it also combines information that is given at different sentences of a text in order to establish the chronological sequence, simple causal- (cause-consequence mechanism) or relational conclusions (the relationship between two (or more) characters, events). In addition, readers draw straightforward inferences in order to fill in gaps in a line of reasoning. The extratextual knowledge (top down) that helps construct an interpretation at this level is probably subject matter knowledge and formal knowledge.

In the third level distinguished, readers interpret the information gathered from a text and integrate it with their own ideas, knowledge and experiences. The resulting interpretation is idiosyncratic since readers interpret a text from their own domain of experience (social and cultural background). These skills focus more on macro-level processes in that the interpretation process is supplemented with more context specific extratextual knowledge: background knowledge as well as cultural schema. Important inferences that are made here regard implications of the information for an issue the text is related to (or related to me as a person), and the extent ideas in the text are consistent with ideas of a reader.

In the last level, a bird's eye view is taken. The interpretation of a text is evaluated (reflected upon) in the light of the type of text/discourse. Readers use their knowledge of linguistic conventions, genres, and familiarity with the author's point of view to arrive at a critical appraisal of the text. On the basis of these skills, readers can adjust the meaning of a text, or look at it from the right perspective (as intended by the author). It corresponds to macro-level processes in which a reader reflects on the text in the light of extratextual knowledge (formal, content, and cultural schema).

This description of metacognitive reading skills makes clear that extratextual knowledge is used to construct an interpretation of a text which refers to reading comprehension. In the next paragraph we will elaborate on the concept of extratextual knowledge.

In general, extratextual knowledge is conceptualized as schemata (Bartlett, 1932), frames (Minsky, 1975), or scripts (Schank & Abelson, 1977) (see for example

Ketchum, 2006; 2008, Erten & Razi, 2009; Nassaji, 2002). These concepts refer to higher order knowledge structures that combine individual concepts, propositions, and general knowledge about a specific topic, as for example what to do in a restaurant (Rummelhart, 1975). A schema can be described as a prototypical representation or a general framework depicting the event (this is what it usually looks like) and prescribes inferences about the event (causal or relational) that generally apply (this is how it usually goes). Within a reading process, these schemata are used in a top down approach to formulate expectations about what could be in a text or be meant by a text. In general, three main categories of schemata are distinguished: formal or textual schemata, content schemata, and cultural schemata. We will discuss each briefly.

A *formal schema*, introduced by Thorndyke (1977) as story grammar, is defined as knowledge about language and linguistic conventions (for more details see Alderson, 2000). The contents of this schema show marked similarities to the definition of genre used in genre studies: *Genre essentially refers to language use in a conventionalised communicative setting in order to give expression to a specific set of communicative goals of a disciplinary or social institution, which give rise to stable structural forms by imposing constraints on the use of lexico-grammatical as well as discoursal resources* (Bhatia, 2004: 23).

A content schema refers to the knowledge of the domain the text is about (Carrel & Eisterhold, 1983). Content schema can be dived into subject matter knowledge and background knowledge. Subject matter knowledge is directly related to the subject of the text. This knowledge is relevant irrespective of the context in which the subject is discussed. Background knowledge regards this context. It reflects the familiarity with and knowledge about a particular (social) context and/or point of view taken that colours the contents of a text.

The last category is *cultural schema*. Ketchum (2006) proposes a cultural schema as a cultural specific extension of background knowledge schema since it refers to conventions, norms, and values that are specific for a particular (sub)culture. A cultural schema indicates how things should be done according to a specific culture as well as the dominant cultural historical perspective taken. If the cultural background of a story matches the cultural schema of a reader, it helps to recreate the story, since a reader can refer to more personally and culturally relevant schemata that give a prototype to recreate a story from a text (Oller, 1995).

Opportunity to read
Opportunity is defined as all contextual and situational factors that facilitate or inhibit the processing of information (MacInnis & Jaworski, 1989). This definition already indicates that opportunity can be divided into contextual and situational factors. Contextual factors are directly linked to the text, such as visibility of the characters and layout of the text, visuals that distract attention, etc. The situational factors refer to the situation in which a person reads the text such as noisiness of the room and perceived time pressure.

1.2 How does (un)familiarity with the cultural background of a story affect reading comprehension?

The main research question focuses on the effect of a (mis)match between the backgrounds of a story and a reader on reading comprehension. In dual-process models it is generally assumed that a person can interpret a text extensively and reach a full comprehension of the text (level 4: macro level processes of reflection upon the text) if a reader has the motivation, ability (reading skills and extratextual knowledge), and opportunity to do so. (Petty & Cacioppo, 1986; MacInnis & Jaworsky, 1989). In this study we regard the background of readers as an (indirect) indicator of their familiarity with their own culture. In consequence, the <u>first hypothesis</u> states that a mismatch in background of a reader and a story results in less comprehension than a match in background (interaction effect between text and reader background).

This general effect can be refined if motivation and ability are taken into account. If a reader is highly motivated, (s)he is willing to invest more effort in processing a text. This tendency may compensate for the mismatch in background. In consequence, the <u>second hypothesis</u> states that reading motivation has a positive effect on reading comprehension. Furthermore, the effect of the background of a reader will probably diminish since background not only indicates familiarity with the own culture, but also differences in reading socialisation. Reading socialization affects the reading attitude, which is an aspect of reading motivation (Broeder & Stokmans, 2013).

Next to an effect of motivation, we expect an effect of knowledge, an aspect of ability. As explained in the introduction, familiarity with different aspects of the text boils down to different schemata identified. If a person reads a lot or is familiar with the writer of the story, one has more appropriate formal schemata. If a person is familiar with the subject, one has appropriate content schemata. These schemata can be used to reconstruct the story from the text and enhance comprehension. In consequence, the <u>third hypothesis</u> states that knowledge has a positive effect on reading comprehension.

2. Research method

To examine the hypotheses stated, we conducted a research that can be characterized as a mixture of an experiment (random assignment of texts) and a survey study (stratified convenience sample and a questionnaire). Teachers were approached to conduct the research in their class if their students met the criteria set by the stratified sampling (see respondents). The survey opened with a question about reading attitude. Then each respondent had to read a short story about a war situation (WWII). After reading this text in his/her own tempo, questions about the text were answered, followed by the rest of the questionnaire.

Selection of the texts

All texts were existing stories about the Second World War, but the geographical, historical and cultural context differed. The geographic areas in which the stories were located were: Russia, the Netherlands, and Morocco. Those three countries were differently involved in the Second World War and have different opinions about this theme. The selection of a text was further restricted to texts that are genuine and culturally bound. In these cases cultural differences (socio-economic and historical context) as well as differences in formal schema (the way these war stories are told in a given culture) are more pronounced. By these criteria, we tried to minimize the differences in content schemata, and maximize differences in formal and cultural schemata without altering the subject.

The texts presented to the respondents were a coherent piece from a story with a length of approximately one page. The Russian text was 'From dusk to dawn' (1974) by N. Kravtsova and handled about a women's battalion. The Dutch text was 'Winter war' (1972) by J. Terlouw and handled about the German occupation in the winter of 1944. The Moroccan text was 'The forgotten hill' (1952) by M. Mammeri and was about leaving a small village in the hill to go to a military training camp. The Russian and Dutch stories can be characterized as Russian and Dutch stories due to the match between the cultural background (use of language and cultural codes) of the author and the geographical and historical setting of the story. The Moroccan story is not purely Moroccan. The geographical, historical and cultural setting could be Moroccan, but is Algerian. Moreover the author himself is Algerian and the story was originally written in French. Despite this, the story could very well be a Moroccan story due to the similarities between the rural setting where it is set (Algerian Kabyle area), and a typical Moroccan rural setting. The choice for this story was made due to lack of similar stories on World War II in Morocco.

Respondents

The respondents approached for the research were higher secondary education students (aged 15-18 years) living in the Netherlands (n=113), Russia (n=145) or Morocco (n=122). The Russian and Dutch respondents answered the questionnaire quite well; item non-response was low (less than 5%). Of the Moroccan respondents 11 had 25% or more of the items not answered (those were excluded from the analyses) and the item non-response for those left in the dataset (n=111) was for some items larger than 25%. Table1 summarizes the important characteristics of the respondents included in the analysis.

Table 1: Description of the sample

Country of birth	Number of respondents in analysis	Valid % male (% missing)	Age (mean, sd)
Netherlands	113	53 (1)	16,10 (0,96)
Russia	145	51 (4,1)	14,56 (0,79)
Morocco	111	47 (3,6)	18,47 (1,25)

The respondents from the different geographic areas were comparable on the percentage of men and women (chi-square (df = 2) =0,833; p>0,05) but differed significantly in age (F (2, 356) = 537,77). Post hoc analysis (Scheffe's) revealed that the Moroccan respondents were significantly (at 5%) older than the Dutch who were significantly older than the Russian respondents.

The questionnaire
The questionnaire incorporated different indicators for reading comprehension of the text just read, motivation to read, and knowledge. These operationalizations will be described successively.

Reading comprehension
Reading comprehension was operationalized as a short version of a reading achievement test that is inspired by the levels of comprehension distinguished in Pirls (Mullis et al, 2006). The levels were:
a. Finding the information explicitly given. Operationalized as: state the order of the events described in the story, and a 'Who is' question (multiple choice).
b. Making straightforward inferences. Operationalized as: integrate information (about social relation or causal relation) that was stated but given in a different sentence of the same paragraph (multiple choice).
c. Interpreting and integrating ideas and information. Operationalized as: integrate causal information that was stated but given in different paragraphs of the text (multiple choice) and interpretation of metaphors used in the text (two open questions).
d. Determining the type of text (purpose of the text). Operationalized as: summarize the feelings experienced by the main character and explain why these feelings have changed (open question).

We did not sum all scores across the four levels, since schemata influence the interpretation of a text differently at different levels of comprehension. In this study we distinguished three levels of comprehension. These levels correspond to the levels described above, except that level c and d, which lean heavily on extratextual information and regard macro level processes, were summed to one index. Table 2 shows the univariate characteristics of reading comprehension.

Motivation to read
In the description of the model we argued that motivation to read consists of a more general part with four antecedents and a specific part regarding text attitude. The items used to operationalize these antecedents were validated in previous research about reading as a leisure activity (Stokmans, 1999; Stokmans, 2003; Stokmans, 2007). The operationalizations of the general reading motivation can be summarized as follows:
a. Hedonic reading attitude was asked for in 5 semantic differentials, such as amusing (5) - not amusing (1).

b. Utilitarian reading attitude was asked for by 4 semantic differentials, such as informative (5) - not informative (1).

c. Involvement with reading was also asked by 3 semantic differentials such as interesting (5) - not interesting (1).

d. Need for cognition was operationalized as 4 statements such as 'I prefer difficult questions above simple ones'. Respondents could answer on a 5- point disagree (1) - agree (5) scale.

Table 2: Univariate characteristics of the variables

	# Of items	Cronbach's alpha	% Missing	Mean	Standard deviation
Reading comprehension					
Level1	3	count	0	1,72	0,89
Level2	3	count	0	1,64	0,95
Level3	3	count	0	0,89	0,87
Attitude towards the text					
Hedonic	5	0,87	1,8	3,14	0,99
Effort experienced	4	0,79	2,0	2,77	1,13
Utilitarian	5	0,87	1,0	2,99	1,08
Motivation to read					
Hedonic attitude	5	0,90	1,0	3,01	1,17
Utilitarian attitude	4	0,88	1,0	3,13	1,26
Involvement	3	0,83	1,8	3,04	1,21
Need for cognition	4	0,70	0,5	2,95	0,84
Knowledge scheme					
Reading fiction	4	0,83	1,0	3.49	1,50
Reading literature	3	0,64	0	3,47	1,24
Attention to literature	9	count	0	3,98	2,33
Topic (WOII)	9	count	0	3,50	1,80
Theme	9	count	0	1,07	1,56
Author	5	count	0	0,27	0,65

The specific part of reading motivation, the attitude toward the text, tapped on the two different components mentioned in the introduction:

a. *Hedonic component: 5 semantic differentials about the overall pleasure experienced while reading the text, such as pleasant (5) - unpleasant (1).*

b. *Utility components: 5 semantic differentials about the usefulness of the story, such as valuable (5) - not valuable (1).*

Due to strong correlations (Dancey & Reidy, 2004) between hedonic reading attitude, utilitarian reading attitude, and involvement (all above 0,75; Cronbach's alpha = 0,92), we averaged the scores on these three constructs into a general reading attitude index.

After this, the correlations between the three remaining antecedents of reading motivation were weak to moderate (Dancey & Reidy, 2004). The largest correlation is between the hedonic text attitude and the utilitarian text attitude (r=0,62), and the lowest is between need for cognition and hedonic text attitude (r=0,11).

Knowledge

In the introduction we distinguished different schemata to conceptualize extratextual knowledge. In the operationalization we used:

a. Schemata about reading fiction: operationalized as the amount (How many books are read? and How much time spent on reading?) and frequency of reading fiction (How often read? and When read for the last time?) as a leisure time activity (4 items). For each of the four questions respondents could choose between seven answers that varied from 'very little' (1) to 'very much' (7).

b. Schemata about reading literature (the genre of the texts presented): operationalized as the amount and frequency of reading literature at school or at home (3 items)

c. Knowledge about literature: operationalized as the sort of contents of the literature lessons. Respondents could indicate what sorts of contents were offered, such as 'teacher explains the interpretation of the text,' and 'discussion of the interpretation of a text in class.'

d. Familiarity with the author: operationalized as information sources used to get acquainted with the author. Respondents could indicate how they got familiar with the author, such as 'my teacher told about the author', or 'I read another book by the author'.

e. Familiarity with the Second World War: operationalized as information sources used to get acquainted with the Second World War. Respondents could indicate what sources (8), such as 'the Second World War was given attention in history class', 'I read stories about it', were used to inform oneself about the Second World War.

f. Familiarity with the theme of the story: operationalized as information sources used to get acquainted with the theme of the story. Respondents could indicate what sources (8), such as 'the theme was given attention in history class', 'my family told stories about the theme', were used to inform oneself about the theme.

The correlations between the aspects of knowledge were weak to moderate (Dancey & Reidy, 2004).The largest correlation is between reading fiction and reading literature (r = 0,56), and the lowest is between familiarity with the author and reading fiction (r= -0,04).

3.   Results

Figure 3 presents boxplots in order to get a brief overview of the differences in reading comprehension levels across geographic areas and texts. In general it is expected that respondents who answer questions correctly at level 3 have a higher probability to answer questions correctly at level 2. And those who answer level 2 questions

correctly, have a higher probability of answering level 1 questions correctly. So one expects ascending proportions of respondents for answering questions correctly at higher levels of comprehension. However, part A of figure 3 reveals that over all respondents, none of the texts represents this expected pattern. For the individual countries (cultural knowledge and differences in reading socialization are more similar then) the expected patterns show up for Russian respondents in all texts, for the Dutch respondents in two texts (not the Moroccan text) and for Moroccan respondents in two texts (not the Russian text).
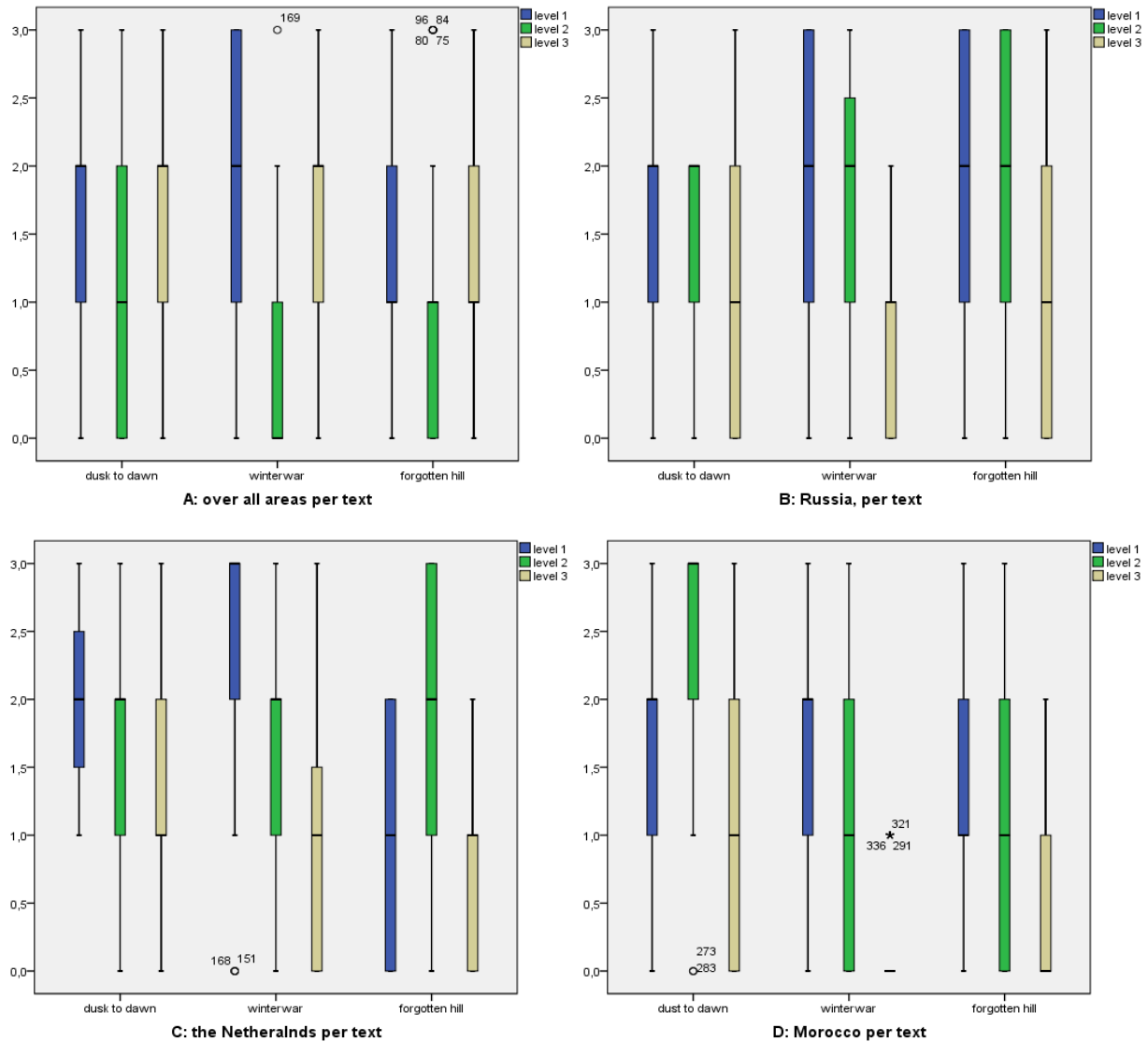

Figure 3: Boxplots for the texts and geographic areas

Furthermore the patterns do not support the expectation that the text that matches the geographical area of the respondents is comprehended best. This counts for all three areas and all three levels of comprehension. In order to test the hypotheses stated in the introduction we conducted analyses of variance (ANCOVA).

3.1 Effect of geographic area and text

In the first hypothesis we suggest an interaction effect between geographic area and text (Area* text) and we assume that a text that matches the geographic area of a respondent is comprehended best. In order to test this hypothesis, we conducted an ANCOVA with the factors geographic area and text, and controlling for age (covariate) and gender.

Table 3 indicates that differences in gender and age do not parallel differences in comprehension level (no significant effect found for gender and age at any of the comprehension levels). Furthermore, the results suggest that the texts differ considerably; at all levels of comprehension the effect of text is significant (text has a significant effect at all comprehension levels).Post hoc analysis indicate that at level 1, Forgotten hill is comprehended least and Winterwar most, at level 2 Forgotten hill is comprehended least and From dusk to dawn most, while at level 3 Winterwar is comprehended least and From dusk to dawn most. Regarding geographical area, table 3 reveals area has no significant effect on level one, a marginal effect on level 2 (p= 0,10), and a significant effect on level three (p = 0,01). This result suggests that geographic area of the respondent affects higher levels of comprehension more.

Table 3: Effect of geographic area and text on levels of comprehension (* p<0,10; **p<0,05; *** p<0,01)

Comprehension		F value	Squared partial eta
Level 1	Area	2,096	-
	Text	23,122 ***	0,119
	Area*text	6,683 ***	0,073
	Gender	0,558	-
	Age	0,012	-
Level 2	Area	2,360 *	0,014
	Text	9,378 ***	0,052
	Area*text	10,346 ***	0,108
	Gender	0,098	-
	Age	1,148	-
Level 3	Area	6,773 ***	0,038
	Text	10,896 ***	0,060
	Area*text	2,796 **	0,032
	Gender	0,035	-
	Age	2,062	-

Last but not least, we see a significant interaction effect between text and geographic area (area * text) at all three levels of comprehension. This result suggests that comprehension at all three levels is affected by the (mis)match between geographic area and text. However, as figure 4 reveals, the pattern does not correspond to the

expectation that a match between geographic area and text results in highest comprehension scores (no peak in the line diagram where the background of the text and respondents match). Moreover the patterns of interaction differ considerably between comprehension levels.
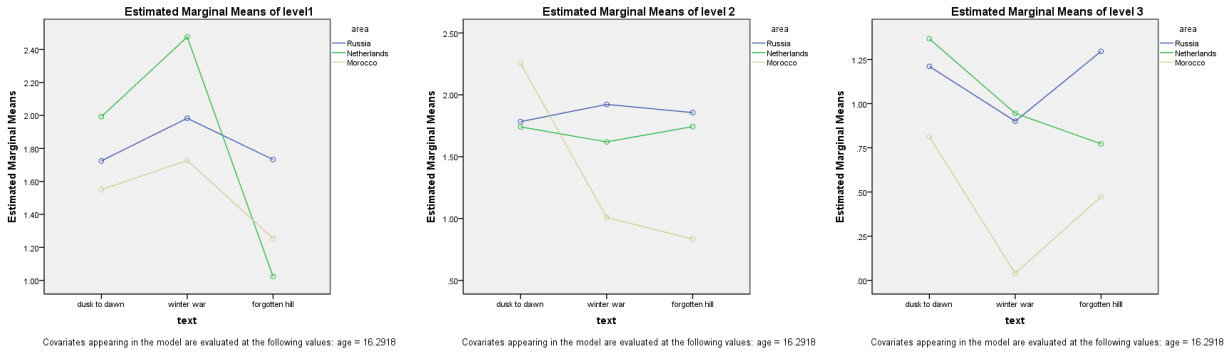

Figure 4: Estimated interaction between geographic area and text for the levels of comprehension

3.2 Effect of geographic area and text controlled for motivation to read

In the second hypothesis we suggested that reading motivation positively affects reading comprehension, next to an interaction effect between geographic area and text. This hypothesis was tested by means of an ANCOVA with the factors geographic area, text, and the motivational variables (covariates) when controlling for gender and age (covariate). An overview of the results is given in table 4.

Table 4: Effect of geographic area and text on levels of comprehension controlled for motivation (* p<0,10; **p<0,05; *** p<0,01)

Comprehension		F value	Squared partial eta
Level 1	Area	0,424	-
	Text	23,68 ***	0,127
	Area*text	7,30 ***	0,082
	General reading attitude	16,84 ***	0,049
	Nfc	0,885	-
	Hedonic text attitude	0,740	-
	Utilitarian text attitude	2,91 *	0,009
	Gender	0,001	-
	Age	0,08	-
Level 2	Area	0,557	-
	Text	10,60 ***	0,061
	Area*text	11,01 ***	0,119
	General reading attitude	2,71 *	0,008
	Nfc	1,49	-
	Hedonic text attitude	1,62	-

	Utilitarian text attitude	2,29	-
	Gender	0,195	-
	Age	0,709	-
Level 3	Area	1,071	-
	Text	11,97 ***	0,068
	Area*text	3,375 ***	0,040
	General reading attitude	10,67 ***	0,032
	Nfc	0,709	-
	Hedonic text attitude	0,570	-
	Utilitarian text attitude	0,678	-
	Gender	0,700	-
	Age	1,533	-

Table 4 indicates that differences in gender and age do not parallel differences in comprehension level (no significant effect found for gender and age at any of the comprehension levels). Again, at all levels of comprehension the effect of text is significant (text has a significant effect at all comprehension levels). The differences between the texts at each level of comprehension match the findings of the previous analysis. Regarding geographical area, table 4 reveals that area has no significant effect anymore at any level of comprehension. So we conclude that the differences that were attributed to geographic area (main effect of area) in the first analysis can in fact be attributed to motivational variables. Regarding the motivational variables, table 4 indicates that the general reading attitude index has an effect on all three levels of comprehension. Additional analysis (regression approach) indicates that this effect is positive: the higher the motivation the higher the scores on (each of the) comprehension levels. Moreover, we found a significant effect of the utilitarian text attitude on the first level of comprehension. Additional analysis indicates that this effect is negative: the higher the utilitarian text attitude the lower the scores on the first level of comprehension. We will go into these results in the discussion.

Last but not least, we see a significant interaction effect between text and geographic area (area * text) at all three levels of comprehension. As in the first analysis, the interaction pattern does not correspond to the expectation that a match between geographic area and text results in higher comprehension scores. The patterns of interaction show a comparable pattern to the first analysis.

3.3 Effect of geographic area and text controlled for knowledge schemata

In the third hypothesis we suggested that different types of knowledge positively affect reading comprehension, next to an interaction effect between geographic area and text. This hypothesis was tested by means of an ANCOVA with the factors geographic area, text, and the knowledge indices (covariates) when controlling for gender and age (covariate). An overview of the results is given in table 5.

Table 5 indicates that differences in gender and age do not parallel differences in comprehension level (no significant effect found for gender and age at any of the comprehension levels). Again, at all levels of comprehension the effect of text is significant, and the differences are similar to those in the previous analyses. Furthermore, the results indicate that geographic area (main effect area) has a significant effect at level 1 and level 3 (not at level 2).

Regarding the knowledge schemata variables, table 5 suggests that reading fiction is only significant for comprehension level 2 (more reading goes with better comprehension). Reading literature is significant for comprehension level 3 (more reading literature goes with better comprehension). Knowledge of literature is significant for comprehension level 1 ($p < 0,10$) and level 3 ($p < 0,05$); more knowledge goes with better comprehension. Knowledge of the topic (WWII) is significant for all three levels of comprehension: more knowledge of WWII facilitates comprehension. Knowledge of the theme and author are not significant. We will go into these results in the discussion.

Table 5: Effect of geographic area and text on levels of comprehension controlled for knowledge (* p<0,10; **p<0,05; *** p<0,01)

Comprehension		F value	Squared partial eta
Level 1	Area	3,409 **	0,020
	Text	27,781 ***	0,142
	Area*text	6,915 ***	0,076
	Reading fiction	2,460	-
	Reading literature	0,639	-
	knowledge literature	3,169 *	0,009
	Author	2,656 *	0,008
	WOII	2,698 *	0,008
	Theme	0,228	-
	Gender	0,587	-
	Age	0,207	-
Level 2	Area	1,248	-
	Text	10,579 ***	0,059
	Area*text	10,954 ***	0,116
	Reading fiction	9,633 ***	0,028
	Reading literature	1,386	-
	Knowledge literature	0,269	-
	Author	0,240	-
	WOII	8,368 ***	0,024
	Theme	1,242	-

	Gender	0,102	-
	Age	0,785	-
Level 3	Area	6,009 ***	0,035
	Text	9,287 ***	0,053
	Area*text	2,601 **	0,030
	Reading fiction	0,674	-
	Reading literature	4,057 **	0,012
	Knowledge literature	3,756 **	0,011
	Author	0,204	-
	WOII	9,395 ***	0,027
	Theme	0,674	-
	Gender	0,028	-
	Age	0,671	-

Last but not least, we see a significant interaction effect between text and geographic area (area * text) at all three levels of comprehension. The patterns of interaction are similar to the pattern reported in the first analysis and do not support our hypothesis.

4. Conclusion and discussion

In this paper we suggested that unfamiliarity with the cultural background of a story results in difficulties in comprehending and interpreting the story. In order to investigate this suggestion we framed reading processes into a dual process approach. This approach suggested that unfamiliarity with a cultural setting can be regarded as an aspect of the knowledge used to recreate a story from a text. This approach also suggests that next to knowledge, motivation to read a story affects the comprehension and interpretation of the story. These lines of thoughts boiled down into hypotheses about the effect of text, geographic area of the respondent, the interaction between those two, motivation to read and knowledge on reading comprehension. These hypotheses were tested in a cross-cultural study.

In all analyses the effects of gender and age were not significant. That is unexpected, since it is believed that women read better than men and that reading comprehension increases with age (OECD, 2014). The lack of effect of gender may partly be attributed to the fact that war stories are not gender neutral: males prefer these stories more than females (Ellis et al, 2008). This difference in preference may affect reading comprehension since preference about a topic (interestingness) may affect motivation to read, as well as content knowledge. The lack of effect of age can partly be attributed to the fact of random assignment of texts within a school class, and partly to the fact that differences in age are confounded with geographic area.

The analyses revealed that geographic area has a main effect on comprehension if the general reading attitude is not taken into account (at all three levels of comprehension), or if 'reading fiction' is not taken into account. These results strongly suggest that differences in reading socialization that boil down in a general reading attitude and a habit of reading fiction affect comprehension at all three levels. In general, it is suggested that reading habits affect both reading attitude and reading skills (Mol, 2010; Stokmans, 2007; Tellegen & Frankenhuisen, 2002). Reading attitude and reading fiction are strongly correlated (Stokmans, 1999, 2007) but this research indicates that they have a differential effect on reading comprehension. Reading attitude affects all three levels of comprehension, but level two only marginally. However, level two is significantly affected by the habit of reading fiction. Further research is needed to unravel the effects of reading habits on reading attitude, reading proficiency and reading comprehension.

All analyses revealed that the texts differ considerably. In all analyses a significant effect of text was reported for all levels of comprehension. At level 1, Forgotten hill is comprehended least and Winterwar most, at level 2 Forgotten hill is comprehended least and From dusk to dawn most, while at level 3 Winterwar is comprehended least and From dusk to dawn most. These results suggest that difficulty of a text is a complex multidimensional concept that can not by expressed in one index. A text can be difficult at low levels of comprehension and easier at higher levels of comprehension. This suggestion can be grounded in the kind of schemata needed to interpret a text.

We expected a quite robust interaction effect between the text and the geographic area of the respondent. According to a dual process model, the story occurring in their own cultural and historical setting should be interpreted best. The data did not support this suggestion. But the complex relationship between 'complexity' of a text and comprehension, as discussed in the previous paragraph, may have affected our finding. Given the ambiguous complexity of the texts used in this study and the various effects of motivation and knowledge at different levels of comprehension it is extremely hard to find support for this suggestion. More research with texts that are less ambiguous in comprehension at different levels is needed to explore this hypothesis further.

The results indicate that reading motivation affects the comprehension of the text and that different levels of comprehension are affected differently. General reading motivation did have a significant effect on comprehension, although the significance on level 2 was marginal. This result suggests that lack of motivation results in less close reading and therewith affects level one comprehension. Furthermore, lack of motivation affects level three comprehension, since a reader is not willing to apply the higher order metacognitive reading processes. Moreover, level one comprehension is negatively affected by an utilitarian text attitude. So if readers think a text is useful, they read a text less close! This effect may be attributed to top-down processes; a reader regards the text as useful because it seems to match with existing schemata (knowledge). Additional research is needed to explore this line of thought.

Last but not least, the results indicate that knowledge affects reading comprehension and that different levels of comprehension are affected differently. Level one consists of a lot of automatic reading processes for respondents in secondary education. In consequence, extratextual knowledge that reflects practicing does not have an effect at this level. Content knowledge does have an effect since it suggests (top down) what kinds of words could be expected. At level two, more complex, meso level reading processes are required. This is reflected in the results, since at this level of comprehension familiarity with reading (fiction in general) has an effect on comprehension, next to content knowledge used to formulate (top down) what could be expected. At the highest level of comprehension, most complex reading processes are required. In consequence schema about literature (knowledge and reading) has an effect on comprehension, next to content knowledge.

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