Background Knowledge, Linguistic Complexity, and Second-Language Reading Comprehension

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In the present study, the role of cultural background knowledge on the reading comprehension of third graders acquiring literacy in Dutch as a first and second language is examined while the children read noncontrived texts from the reading curricula. Children were given three types of texts: texts referring to Dutch culture, texts referring to the cultures of immigrants from Near Eastern countries (i.e., Turkey and Morocco), and neutral texts. Within each type of text, a distinction was made between two levels of linguistic complexity. By means of reading-aloud protocols, retelling and questioning the children's reading performance on the distinguished types of texts was analyzed. A facilitating effect of cultural familiarity was found for both reading comprehension and reading efficiency. For the minority children, this effect was restricted to linguistically simple texts, because of their limited knowledge of the target language, Dutch.

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The relation between background knowledge and reading comprehension in native-language reading has been investigated extensively. Results in this area have consistently shown a facilitating effect on reading comprehension, in both adults and children, of having background knowledge of the topic of a text (see Anderson & Pearson, 1984; Weber, 1991).

Studies comparing experts with novices have made it clear that people with high domain knowledge comprehend a text better than those who lack that knowledge. Adams, Bell, and Perfetti (1995) investigated the relation between children's knowledge of a specific domain (football) and reading skill in text comprehension among fourth to seventh graders. Their conclusion was that reading skill and domain knowledge make complementary contributions to reading comprehension and reading speed. High-skilled readers with little domain knowledge compensate for their lack of knowledge by relying on their general reading skill, and low-skilled readers with high domain knowledge compensate for poorer reading skills by relying on their specific domain knowledge. Stahl, Chou Hare, Sinatra, and Gregory (1991) studied domain knowledge in relation to vocabulary knowledge among 10th graders. They concluded that domain knowledge and vocabulary knowledge have independent effects on comprehension, and that these effects are on what is comprehended as well as on how much is comprehended. Vocabulary difficulty had an effect on the construction of the microstructure of the text, whereas domain knowledge, in this case baseball knowledge, appeared to have an effect on the participants' macroprocessing. Fincher-Kiefer (1992) also found that domain knowledge facilitated the inference tracking necessary in building a macrostructure of a text.

In a number of studies, it was found that the cultural background of the reader may affect the type of information remembered. Bügel and Buunk (1996) demonstrated that the text topics of a foreign-language reading comprehension examination gave an advantage to boys, because the topics of the texts were of more interest to boys than girls. Lipson (1983) compared the reading comprehension of children in relation to their religious affiliation and found an effect of religious affiliation on reading comprehension when children read texts about a topic dealing with aspects of their familiar or unfamiliar religion. Pritchard (1990) examined the role of cultural schemata on the reading comprehension processes of proficient 11th-grade readers with an American or a Palauan background. Both groups read two letters in their native language, which dealt with funeral ceremonies in the two countries. The students were asked to give verbal reports of their reading strategies as they were reading and to retell the passage after reading. From the verbal reports, Pritchard concluded that cultural schemata influence the processing strategies as well as the level of comprehension.

Research has also provided evidence for a substantial role of background knowledge in reading comprehension in a second language. Steffensen, Joag-Dev, and Anderson (1979) found that familiarity with the topic helps the second-

language reader to construct meaning. Malik (1995) studied the oral-reading behavior of proficient second-language readers using culturally familiar and unfamiliar texts. He found that cultural schemata significantly affected the reading comprehension process, in that the reading of unfamiliar text involved less integration compared with familiar text. Johnson (1981) examined the effect of both linguistic complexity of a text and the cultural origin of a text among a group of Iranian ESL students and American monolingual students. Half of the participants read two unadapted English texts of two stories, one from Iranian folklore and one from American folklore. The other half read the same stories in adapted or simplified English. Results on a multiple-choice test with questions on explicit and implicit information in the texts indicated that the cultural origin of the story had more effect on the comprehension of the ESL students than the level of semantic and syntactic complexity (adapted versus unadapted). For the native English readers, however, both the level of syntactic and semantic complexity and the cultural origin of the story affected comprehension. They were better able to understand the unadapted English version and the story based on American folklore.

Studies on the effect of background knowledge on second-language reading have so far been carried out almost exclusively with adults. Only a very few studies have focused on children (cf. Au, 1993; Bernhardt, 1991; Steffensen, 1987). The effect of different cultural schemata on the reading comprehension of children from different cultural backgrounds in the United States was studied by Reynolds, Taylor, Steffensen, Shirley, and Anderson (1982). They showed that students from a White, agricultural area were disadvantaged when reading an ambiguous text referring to a cultural aspect of students from a Black, working-class area. Steffensen (1987) found that the religious background of ESL children affected their reading comprehension scores. Children with a Christian background turned out to have higher comprehension scores on a text describing a Christmas celebration. Kerkhoff and Vallen (1985) studied the relation between cultural origin of a text and second-language reading comprehension of Dutch, Turkish, and Moluccan children living in the Netherlands. They found a clear interaction between text and ethnicity, indicating a facilitating effect if the children's background and the cultural origin of the text matched.

The contribution of background knowledge to comprehension has become clear from a range of experimental studies manipulating relevant sources of knowledge under varying conditions in both first- and second-language readers. However, most of these studies concern adult readers. Knowledge about the impact of cultural schemata on the reading behavior of children is important because of the consequences for reading education. The question is, how do children understand texts in existing reading curricula that refer to situations that they do not, or only partly, share? Cultural schemata issues may be exacerbated for language-minority children who are reading texts in their second language.

The Present Study

In the present study, the role of background knowledge in first- and second-language reading comprehension of children in the Netherlands is examined. The study took place among Dutch, Turkish, and Moroccan children. Turks and Moroccans make up the largest immigrant groups in the Netherlands. During the seventies and eighties, they were recruited for unskilled, temporary labor. Therefore, they are mainly concentrated in the industrial areas. Although in the beginning, the migration was seen as temporary, at the end of the seventies, the permanent character became clear and family reunion started. Both groups are characterized by a low educational level and low vocational jobs. The percentage of unemployment among these groups is high. The children who participated in the study form part of the second generation of Turkish and Moroccan immigrants. Their parents can be seen as predominantly first-language speaking with only limited competence in the second language, Dutch. The children, most of whom are born in the Netherlands, participate in a quite complex linguistic network. Their early language input is mainly the first language of the parents, but soon the Dutch language enters into their lives by way of Dutch playmates and school. At school, the language of instruction is Dutch. For 2½ hours a week, they can attend lessons in their home language during school time in kindergarten (2 years) and primary school (6 years).

In the present study, reading texts originating from actual reading curricula are taken as the starting point in the analysis of the reading comprehension of Dutch, Turkish, and Moroccan students in the third grade of primary school. A distinction was made between three types of texts: texts referring to the majority (Dutch) culture, texts referring to the minority (Near Eastern) culture, and neutral texts considered to be equally familiar to both groups. Moreover, two levels of linguistic complexity were distinguished to examine the differential role of linguistic complexity on the capacity of first- and second-language readers to make inferences based on background knowledge. An attempt was made to answer the following research questions: (a) Does the cultural background of schoolbook texts influence first- and second-language reading comprehension? (b) To what extent does the linguistic complexity of the text constrain the effects of different cultural schemata on first- and second-language reading comprehension?

Method

Participants

The children in our study were selected from a larger project (see Droop & Verhoeven, 1996) in which 150 Dutch and 150 minority third graders of 20

schools participated. The children were tested on language proficiency, reading comprehension, and decoding skills. The minority children turned out to have lower scores on Dutch oral proficiency measures of vocabulary, on morphosyntactic knowledge and listening comprehension, and on Dutch reading comprehension than their native-speaking peers. For decoding skills, no significant differences were found. From these samples, we randomly selected children with an average or above-average score on the standardized test for word decoding, resulting in a combined score for speed and accuracy of reading words out of context. This measure was used as a criterion for selection in order to exclude the attribution of comprehension problems to low decoding skills.

For the present study, 70 third graders of 15 schools were selected: 35 Dutch children, 17 Turkish children, and 18 Moroccan children. All children came from working-class families, as based on the parents' attendance at lower level vocational schools and employment as workers and small shopkeepers. Within each ethnic group, the number of boys and girls was nearly equal. The mean age was 9.1 years for the Dutch children, and 9.4 years for the minority children. The minority children were all born in the Netherlands or had at least attended kindergarten in the Netherlands. They lived in homes where a language other than Dutch was spoken. Whereas their early language input was restricted to their native language, the Dutch language entered into their lives only gradually through playmates and school.

Materials

To find out in what way comprehension was influenced by background knowledge and linguistic complexity, the children were given six expository texts selected from Dutch curricula that differed in cultural reference of the topic and in linguistic complexity.

The procedure of text selection was as follows. From a variety of reading curricula and schoolbooks, 27 expository texts with different cultural topics were selected. To refer to the home culture of Turkish and Moroccan children, we selected topics that referred to common aspects of these cultures (e.g., the Islamic way of life). The selected texts had about the same length but differed in linguistic complexity. In addition, we compiled the texts in a random order and asked 10 primary-school teachers, 10 Turkish and Moroccan students in a teacher-training course, and 10 researchers in our linguistics department to classify the cultural reference of the topic of the texts on a scale of 1 to 5, ranging from "topic culturally familiar for Turkish and Moroccan children" to "neutral" to "familiar for Dutch children." The interrater reliability turned out to be high (Cronbach's alpha .98 for the total group), which meant the judges agreed to a large extent in their decisions. They also made clear choices whether a text referred to either culture. This result showed that it was possible to grade texts with respect to the cultural reference for both groups.

On the basis of these judgements, six texts of about 280 words were selected. Their linguistic complexity was analyzed by counting the mean length of sentences, words, and syllables. We also looked at complexity of verbal groups and noun compounds. A distinction could be made between three linguistically simple texts and three linguistically more complex texts. As regards the notion of linguistic complexity, a few words of caution are in order. As has been shown by Davison and Green (1988), the simple structural aspects of a text do not completely coincide with its complexity for the reader.

The texts referring to Dutch culture dealt with care for the elderly in retirement homes (simple condition) and the diary of Anne Frank and World War II Memorial Day (complex condition). Neutral text topics were about the making and recycling of paper (simple condition) and migratory birds (complex condition). The topics referring to the culture of the minority groups were the ceremonies of a henna party before an Islamic wedding (simple condition) and a journey through the desert including a description of a visit to a mosque (complex condition). Though we tried to stay as close as possible to the original text, we had to change minimally the texts in the two complexity levels to make them comparable in terms of their readability. To illustrate the notion of linguistic complexity and cultural familiarity, two brief translated excerpts are given. The first is an excerpt of the simple text referring to aspects of the culture of the minority children. The second is an excerpt of the complex text referring to aspects of the culture of Dutch children.

> At the end of the evening the woman prepare the henna. They make a paste of henna powder and water. With that paste they decorate the hands and feet of the bride. Then the women decorate each other. Finally the children are decorated. They put a piece of cloth around their hands and feet. The next morning everything is nicely red.

> Every year at the fourth of May many people remember the Second World War. They think especially of the people who, like Anne Frank, died because of war. At eight o'clock in the evening everybody is silent for two minutes to recall them. At that evening the flags are hanging half-mast as a sign of grief.

For all texts, five questions were constructed to assess prior knowledge of concepts and actions that appeared in the text, as well as 12 *wh*-questions to assess reading comprehension. The Appendix contains a complete example of one of the texts along with the prior-knowledge and comprehension questions.

Procedure

Each child was tested individually. First, the prior-knowledge questions were orally presented to the child. The answers were tape recorded. Next, each child's oral reading was tested during two sessions. In the first session, the child read the three linguistically simple texts. During the second session, the child read the three

complex texts. In each session, the child was given three types of texts – texts referring to cultural knowledge of the minority group, texts referring to background knowledge of the majority Dutch group, and neutral texts – according to a randomized block design.

The children were asked to read the text aloud, which was a common task for them that they often performed in class. Reading aloud made it possible to check how each child read the text and to what extent misreadings were made. The children were asked to read the text carefully and to try to comprehend what it was about, because they had to retell the story and answer some questions about it afterwards. While each child read the text, the researcher marked miscues. After finishing, the child was asked to retell as much as possible. ("Imagine your teacher enters and she asks you what this text was about. And she did not read the text. What would you tell her? Tell her all you remember.") Children were encouraged to tell as much as possible. In addition, the comprehension questions were posed. Retellings and questioning were performed in Dutch, which has been the language of literacy instruction for all of the children since kindergarten.

The whole procedure was tape recorded. Afterwards, miscues in reading aloud were checked, and the reading time was recorded. The total number of miscues was counted. As a measure of reading efficiency, the number of words read correctly per minute was computed for each text. Miscues were categorized into six categories based on the classification system of Goodman (1969): deletion/substitution of affix, word substitution, deletion of content word, deletion of function word, word insertion, and word permutation.

Transcripts were made of the retellings and of the answers on the prior-knowledge and comprehension questions. Scoring took place on the basis of these transcripts. Prior-knowledge questions were scored 1 or 0. For the comprehension questions, there were three possible scores: 2, completely correct; 1, partly correct; and 0, wrong answer. To score the retellings, the texts were divided into propositions according to the definition of Thorndyke (1977), who stated that a proposition is a sentence or clause describing one action or one situation. For each proposition recalled, 1 point was given.

All measures turned out to be sufficiently reliable. Cronbach's alpha for the prior-knowledge questions was .78. For the comprehension questions, the numerical value of Cronbach's alpha was .84 (Dutch topics), .84 (neutral topics), and .75 (minority topics).

To test the differences in prior knowledge between the Dutch and minority children, a multivariate analysis of variance (MANOVA) followed by a discriminant analysis was performed. In addition, a MANOVA with repeated measures was used to test the impact of cultural reference of the text on its comprehension and on its process characteristics. In these analyses, it was determined whether the main effects of Group, Linguistic Complexity, and Cultural Reference were significant. To find evidence for a significant role of background knowledge in reading comprehension, the interaction between Group and Cultural Reference

was of special interest. Moreover, the three-way interaction between Group, Cultural Reference, and Linguistic Complexity was seen as relevant in order to check the role of linguistic complexity of the texts in relation to the effect of cultural reference.

Results

Prior Knowledge

Table 1 presents the means and standard deviations of the Dutch and minority children on the prior-knowledge questions for each topic (maximum score = 5), along with the results of the MANOVA and the standardized discriminant function coefficients. The table shows that the Dutch children obtained higher scores than the minority children on the topics referring to the Dutch culture. On the other hand, the minority children had higher mean scores on the topics referring to their culture. The Dutch children obtained higher scores on the neutral topics. The results of the MANOVA showed that there were overall differences in topical knowledge between the two groups (Wilks's lambda = .37, $F = 17.57$, $p = .000$). The results of the univariate analyses showed that for each topic the differences in means were significant (see Table 1). The standardized discriminant function coefficients indicated that the strongest discriminating values were found for the topic on the home for the elderly and the topic on the desert. The lowest values were found for the neutral topics, whereas the topics on the henna party and Anne Frank had moderate coefficients.

TABLE 1. Means, Standard Deviations, Univariate *F*-tests, and Standardized Discriminant Function Coefficients on the Prior-Knowledge Questions

	Dutch children (n = 35)		*Minority children (n = 35)*				
	M	*SD*	*M*	*SD*	*F(1, 68)*	*p*	*Discr.*
The elderly	4.11	1.3	1.77	1.9	35.94	.000	1.01
Paper	3.29	.93	2.46	1.01	12.79	.001	.155
Henna party	2.06	1.06	2.80	1.41	6.22	.015	–.446
Anne Frank	2.23	1.17	1.09	1.25	14.43	.000	.407
Birds	3.20	1.18	2.31	1.08	10.71	.002	–.181
Desert	2.57	1.07	3.31	.99	9.10	.004	–.657

Note. Multivariate test for ethnic group: Wilks's lambda = .37, $F = 17.57$, $df = 6$, *error* $df = 63.00$, $p = .000$.

Though some children simply answered "I don't know" when they did not have any idea of the concepts they were questioned on, some children gave insight into the ideas they had about some concepts. As far as the Dutch topics are concerned, many Turkish and Moroccan children thought the Dutch word *bejaardenhuis* (home for the elderly) referred to a school for disabled children. The word *bevrijdingsfeest* (liberation day) was interpreted by many minority children as the day when you are released from prison. Most of the Dutch children, on the other hand, had difficulty in defining the word *henna.* Some of them thought a mosque to be a restaurant ("*you go there, sit on the ground near small tables, and eat meat, pork*") or a shop where you can buy sweets. They did not know the rules before entering a mosque or what it looked like inside.

Comprehension Questions

In Table 2, the means and standard deviations for the comprehension questions are presented for each text (maximum = 24), as well as the total score for the three cultural conditions (maximum = 48). For the linguistically simple condition, the scores of the Dutch children on the text referring to Dutch culture as well as on the neutral text were higher than the scores of the minority children.

TABLE 2. Means and Standard Deviations for the Dutch and Minority Children on the Comprehension Questions per Text

	Dutch children (*n* = 35)		*Minority children* (*n* = 35)	
	M	*SD*	*M*	*SD*
Linguistically simple				
The elderly	17.66	4.29	13.06	3.98
Paper	17.86	4.49	13.29	4.92
Henna party	14.23	4.08	15.17	5.65
Linguistically complex				
Anne Frank	13.89	4.87	9.94	5.12
Birds	12.80	4.37	9.63	4.80
Desert	13.23	4.25	10.89	4.36
Total				
Total Dutch	31.54	7.93	23.00	8.36
Total neutral	29.45	7.82	21.91	8.95
Total minority	27.45	6.66	26.05	8.71

However, on the text referring to the minority culture, the score of the minority children was slightly higher. For both groups, the results on the linguistically complex texts were lower than those for the simple texts. Within the complex texts, the minority children obtained higher scores on texts referring to their culture than on texts of the neutral and Dutch condition.

The results become clearer when we look at the total score for each condition. In Figure 1, a graphical representation of the mean scores is presented. It can be seen that there is a clear effect for background knowledge for the linguistically simple texts in the two groups.

A 2 (Group) × 2 (Linguistic Complexity) × 3 (Cultural Reference) MANOVA confirmed these observations. The main effect for the Group factor turned out to be significant ($F[1, 68] = 11.05, p < .001$), indicating that the Dutch children obtained higher results than the minority children. Furthermore, the main effect for the Linguistic Complexity factor was significant ($F[1, 68] = 123.67, p < .001$). The results of both groups are higher for the simple texts than for the complex ones. The nonsignificant interaction Group by Linguistic Complexity indicates that there was no significant difference between the two groups on the linguisti-

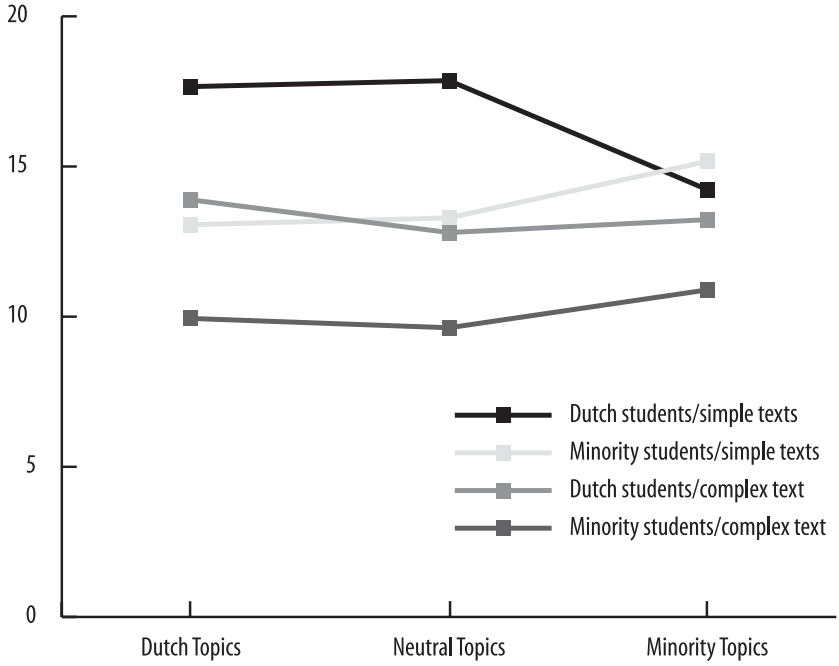

FIGURE 1. Graphical Representation of the Mean Scores on Comprehension Questions per Text

cally simple and linguistically complex condition. With respect to the factor cultural reference, no significant main effect was found. For the total group of children, the texts were equally difficult. However, the interaction Group by Cultural Reference turned out to be significant ($F[2, 136] = 16.09, p < .001$). It can be concluded that the children comprehended texts referring to their own culture better than texts that dealt with unfamiliar topics. Though the interaction Linguistic Complexity by Cultural Reference was not significant, a tendency toward significance was found ($F[2, 136] = 2.59, p = .08$), indicating that there was a tendency for the influence of cultural knowledge to be stronger for the simple texts. Finally, the interaction Group, Linguistic Complexity, and Cultural Reference was clearly significant ($F[2, 136] = 5.72, p < .01$). We can conclude that especially for the minority children the effect of cultural reference was dependent on the linguistic complexity of the text. For this group, the effect was only found for the linguistically simple texts.

Analysis of Recall

For each text, the proportion of propositions recalled was computed. The mean proportions in retellings per text are presented in Table 3.

Both groups recalled only little information about each text. This was true for both the simple and the more complex texts. It can be concluded that the children in our study found it difficult to recall a text. A MANOVA with Group, Linguistic Complexity, and Cultural Reference as factors showed that none of the

TABLE 3. Mean Proportion of Propositions Recalled in Retellings per Text for Dutch and Minority Children

	Dutch children ($n = 35$)		*Minority children* ($n = 35$)	
	M	*SD*	*M*	*SD*
Linguistically simple				
The elderly	.23	.12	.19	.11
Paper	.20	.10	.17	.11
Henna party	.21	.10	.20	.12
Linguistically complex				
Anne Frank	.22	.10	.18	.11
Birds	.26	.34	.17	.11
Desert	.18	.09	.17	.13

main effects turned out to be significant. However, the interaction Group by Cultural Reference showed a tendency toward significance ($F[2, 132] = 2.87$, $p = .06$), indicating that both groups recalled more information about familiar topics.

Process Characteristics

In Table 4, the numbers of misreadings per 100 words and accompanying standard deviations are presented for each text. For both groups, the number of misreadings was a bit higher for the complex texts than for the simple texts. A MANOVA with the factors Group, Linguistic Complexity, and Cultural Reference showed a significant interaction Group by Cultural Reference ($F[2, 136] = 3.07$, $p < .05$), as well as a significant three-way interaction Group by Linguistic Complexity by Cultural Reference ($F[2, 136] = 3.68$, $p < .05$), indicating an effect of cultural reference on the text that was felt stronger for the simple texts than for the complex ones.

As a measure of reading efficiency, the number of words read correctly per minute was computed. The results for this measure are presented in Table 5. For both groups, a higher reading efficiency rate was found for the simple texts than for the complex ones. Within the simple condition, the Dutch children obtained the highest efficiency rate for the elderly text and the lowest for the neutral text. For the minority children, the highest rate was obtained for the henna text and the lowest for the neutral text. Within the complex condition, both groups obtained the lowest result for the desert text. The Dutch children scored highest for the text about Anne Frank, whereas the minority children had the highest results for the text about birds.

TABLE 4. Mean Number of Misreadings per 100 Words for Dutch and Minority Children

	Dutch children ($n = 35$)		*Minority children* ($n = 35$)	
	M	*SD*	*M*	*SD*
Linguistically simple				
The elderly	1.87	1.18	2.01	1.27
Paper	2.41	1.58	2.37	1.36
Henna party	1.95	1.85	1.88	1.34
Linguistically complex				
Anne Frank	2.59	1.86	2.53	2.00
Birds	3.32	1.97	2.77	1.95
Desert	2.68	1.76	3.36	1.77

Two significant interactions were found in the MANOVA. The interaction Group by Cultural Reference was significant ($F[2, 136] = 5.78, p < .01$), as well as the interaction Linguistic Complexity by Cultural Reference ($F[2, 136] = 40.11, p < .001$). It can be concluded that reading efficiency was influenced by the cultural background of the text. This influence was clearly evidenced for the simple texts, but not for the complex texts.

The results of these analyses confirm the pattern found in the comprehension questions. In all cases, the interaction Group by Cultural Reference turned out to be significant. It can thus be concluded that there was an effect for cultural content of the text on both reading comprehension and reading efficiency. Again, this effect was only found for the linguistically simple texts. As for the complex texts, both groups had more problems in processing the desert text. For the Dutch children, this might be due to the unknown topic, whereas for the minority children, the linguistic complexity might be the bottleneck.

To get more insight into text processing differences, an analysis of the types of misreadings was performed. The analysis might give information about processing differences in terms of top-down or bottom-up reading strategies. In Table 6, the proportions of types of misreadings are given for each text. For both groups, the most frequent misreadings were substitutions. Deletion of content words or a change in word order seldom occurred. The proportion of substitutions was higher for the minority children than for the Dutch children. To a much larger extent than the Dutch children, the minority children substituted nonwords for words, or words that were not appropriate in the context. In contrast, the Dutch children more often deleted function words or inserted words, mainly function words, without changing the meaning of the text. This might indicate that the Dutch children used more top-down strategies while processing a

TABLE 5. Reading Efficiency Rate per Text for Dutch and Minority Children

	Dutch children ($n = 35$)		*Minority children* ($n = 35$)	
	M	*SD*	*M*	*SD*
Linguistically simple				
The elderly	121.42	20.37	108.11	18.91
Paper	116.63	18.91	104.93	21.29
Henna party	120.83	19.92	114.32	21.12
Linguistically complex				
Anne Frank	108.00	18.19	95.53	19.14
Birds	105.08	17.70	97.74	19.32
Desert	98.43	19.21	90.01	17.39

TABLE 6. Proportions of Types of Misreadings per Text for Dutch (D) and Minority (M) Children

	The elderly		*Paper*		*Henna party*		*Anne Frank*		*Birds*		*Desert*	
	D	*M*	*D*	*M*	*D*	*M*	*D*	*M*	*D*	*M*	*D*	*M*
1	16.3	26.6	15.9	31.4	22.0	32.8	17.9	20.6	28.3	28.5	19.5	19.5
2	34.2	31.5	27.5	40.8	43.5	45.8	41.8	51.8	34.1	39.3	47.9	56.3
3	2.2	1.6	4.3	3.1	1.0	.6	.7	2.3	.6	.7	1.7	1.2
4	26.6	27.7	24.9	14.8	17.3	12.4	17.1	14.0	18.4	21.9	16.5	12.7
5	20.1	12.0	27.0	9.9	15.7	7.9	21.8	10.9	16.3	8.9	13.2	10.3
6	.5	.5	.4	0	.5	.6	.7	.4	2.0	.7	1.0	0

Note. 1 = deletion/substitution of affix, 2 = word substitution, 3 = deletion of content word 4 = deletion of function word, 5 = word insertion, 6 = word permutation

text, whereas the minority children were more bound to the text and used bottom-up strategies.

Discussion and Conclusions

Several conclusions can be drawn from the present study. The study shows that it is quite possible to categorize texts with respect to their cultural reference. Three groups of judges highly agreed on their decisions regarding the cultural content of the text. More important is the finding that children of varying cultural backgrounds differ in the extent to which their prior knowledge is reflected in the supposed cultural content of the texts.

Furthermore, it can be concluded that background knowledge plays a substantial role in comprehension of texts used in present-day reading curricula. The study gives evidence that cultural background knowledge affects not only the comprehension scores and the recall of text propositions, but also the reading efficiency of children acquiring literacy in a first and second language. The results are most striking for comprehension scores. For recall of text propositions, only a tendency toward an effect of background knowledge was found. Text recall turned out to be a difficult task for the children at this level of reading proficiency. This might be partly explained by the fact that the texts were expository and did not have a strong text structure to facilitate their retellings. With respect to reading efficiency, it was found that it is not so much reading accuracy that accounts for the differences, but rather reading speed. It can be assumed that

lack of background knowledge may hamper the reading process in such a way that there is an overload of short-term memory.

An important finding is that the influence of cultural background knowledge on reading comprehension is only valid for texts of which the linguistic complexity is within the reading level of the child. If the linguistic complexity of the text goes beyond that level, the effect of cultural reference of the text on children's reading comprehension tends to fade away. In our study, this tendency appeared to be especially true for the second-language learners. It seems that, because of a limited proficiency in the target language, these children cannot profit from their background knowledge if texts are linguistically more complex. This result seems to be in contrast with the results of Johnson (1981), who also examined both linguistic complexity and background knowledge in adult first- and second-language reading. She concluded that for the second-language readers background knowledge was a stronger determining factor than the semantic and syntactic complexity of the text. However, in our study, we dealt with children who were not only involved in the second-language acquisition process but who also had had limited reading instruction. It can be presupposed that they had not yet gained full control of flexible reading strategies, like using background knowledge, when reading a linguistically complex text.

With respect to the role of children's competence in the target language Dutch, it should be kept in mind that second-language learners are disadvantaged when they have to retell a text in their second language. Lee (1986) has shown that second-language students present better recall of second-language text when allowed to produce the recall in their first language. However, earlier studies on the process of bilingual development of minority children in the Netherlands have shown that by the end of the second grade Dutch tends to become the dominant language (Verhoeven, 1990, 1994).

The results of the present study are in line with the outcome of previous experimental studies performed with children and adults. It is important to note that earlier findings on artificially constructed experimental reading tasks can be generalized to reading materials that originate from actual reading curricula. However, with respect to the present findings, a few words of caution are in order. It can be questioned how representative the texts in the present study are in current reading curricula. We do not know how frequently minority children, as compared to Dutch children, encounter texts in the regular curricula for which they do not have the appropriate cultural schemata. However, analysis of curriculum materials shows that basal reading programs and content curricula highly focus on texts conveying middle-class, White cultural background information (Hoffman et al., 1994; Mok & Reinsch, 1993; van der Vlerk, 1991). The same occurs in standardized reading tests (García, 1991; Uiterwijk, 1994).

The present findings have important implications for the education of children from varying cultural and linguistic backgrounds. Teachers and educational specialists should consider both the children's language proficiency and

their background knowledge and sequence instruction according to the children's abilities. They have to be alert that the content of textbooks may not be familiar to all children to the same extent. The results of the present study make clear that from the very beginning of literacy instruction, reading should be seen as a *content-specific activity.* For curricular planning in reading education, it is important to stress once again the importance of prereading activities, such as discussing the content of a story, providing background information, building a common experience, and explaining difficult lexical items in order to help children develop or activate background knowledge that is relevant to their reading materials. Text structure should also be highlighted in instruction by making the relations between the ideas in the text explicit. It can be assumed that students will often acquire new knowledge from moderately unfamiliar texts in which relevant background cues as well as good structural cues are offered simultaneously. On the other hand, our data indicates that children who read culturally familiar text display increased reading fluency and greater text comprehension. Therefore, publishers should be encouraged to include a range of culturally relevant and authentic texts.

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APPENDIX

Example text with accompanying prior-knowledge and comprehension questions, with adapted version in English.

Original Dutch

Voorkennisvragen

1. Waar wordt papier van gemaakt?
2. Wat is karton?
3. Waarom verzamelen veel mensen oud papier? Wat gebeurt er met dat papier?
4. Waar wordt papier gemaakt?
5. Wat is kringlooppapier?

Er bestaan veel soorten papier. Je hebt dik papier en dun papier. Je hebt papier om op te schrijven, zoals schriften. Er is papier om mee schoon te maken, zoals w.c. papier en zakdoekjes. En er is papier om iets mee in te pakken. Heel dik en stevig papier is karton. Dozen worden van karton gemaakt.

Vroeger maakten de mensen papier met de hand. Ze stopten oude lappen in een bak met water. Die lappen stampten ze kapot. Zo ontstond er een dikke pap. Met een platte zeef schepten ze wat van die pap uit de bak. Er bleef dan een dun laagje op de zeef liggen. Het water werd eruit geperst. Dan kreeg je een nat vel papier. Zo'n nat vel werd opgehangen om te drogen.

Nu wordt papier in fabrieken gemaakt. Daar zijn heel veel bomen voor nodig. Die bomen worden in snippers gehakt. Samen met lappen en water gaan ze door allerlei machines. Er worden grote rollen papier tegelijk gemaakt. Het papier is nu dunner dan vroeger.

Papier maken kost veel bomen. Daarom verdwijnen er steeds meer bossen. Er worden wel nieuwe bomen gekweekt. Maar bomen groeien niet zo snel. Toen kreeg iemand een idee. Oud papier kun je opnieuw gebruiken! Dat gebeurt nu heel veel.

Van oud papier wordt in fabrieken nieuw papier gemaakt. Veel scholen verzamelen oude kranten en oud papier. Ze krijgen er geld voor. Het oude papier gaat naar de fabriek. Daar maken ze er weer nieuw papier van. Dat papier heet kringloop papier. Kringloop papier is een beetje grijs. Maar je kunt er goed op schrijven. En het kost geen bomen. Het wordt immers gemaakt van oud papier.

Tekstbegrip Vragen

1. Waar worden dozen van gemaakt?
2. Wat is karton?
3. Waar werd papier vroeger van gemaakt?
4. Hoe werd papier vroeger gemaakt?
5. Waar wordt papier nu van gemaakt?
6. Waarom verdwijnen er veel bossen?
7. Wat kun je maken van oud papier?
8. Hoe heet dat papier?
9. Welke kleur heeft kringlooppapier?
10. Waarom is het goed dat er van oud papier weer nieuw papier wordt gemaakt?

11. Wie verzamelen vaak oud papier?
12. Wat doen de scholen met het oude papier dat zij verzameld hebben?

English Translation

Prior-Knowledge Questions

1. What is paper made of?
2. What is cardboard?
3. Why do people collect waste paper? What is done with this paper?
4. Where do they make paper?
5. What is recycled paper?

There are many kinds of paper. There is thick paper and there is thin paper. There is paper to write on, like an exercise book. There is paper for cleaning, like toilet paper and tissues. And there is paper to wrap things up. Very thick and strong paper is cardboard. Cardboard boxes are made of this.

In the past people used to make paper by hand. They put old rags in a kettle with water. They ground the rags down to small pieces. Thus it made a thick paste. With a flat sieve they scooped a bit of this paste out of the kettle. Only a thin layer remained on top of the sieve. The water in this layer was then pressed out. A layer of wet paper remained. This paper was then hung out to dry.

Paper is nowadays produced in factories. Many trees are needed to make paper. These trees are cut to small wood chips. Together with rags and water they are put in a machine. Large rolls of paper are made this way. This paper is a lot thinner than it was in the past.

It takes a lot of trees to make paper. More and more forests disappear because of this. New trees are being planted. But trees take a long time to grow. Then somebody got a good idea. Old paper can be used again! This is used a lot nowadays.

In factories old paper is used to make new paper. Many schools collect old newspapers and waste paper. They get some money for it. The old paper is taken to the paper factory. There they use it to make new paper. This new paper is called recycled paper. Recycled paper is a bit gray. Still you can write on it very well. And it saves a lot of trees as it is made out of old paper.

Comprehension Questions

1. What are boxes made of?
2. What is cardboard?
3. What was used in the past to make paper?
4. How was paper made in the past?
5. What is used to make paper nowadays?
6. Why are many forests disappearing?
7. What can be made out of old paper?
8. What is this paper called?
9. What is the color of recycled paper?
10. Why is it such a good thing that old paper is used to make new paper?
11. Who often collects old paper?
12. What do schools do with the old paper they have collected?

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