Sekseverschillen in tekstbegrip bij moderne vreemde talen.
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Document Version
Publisher's PDF, also known as Version of record

Publication date:
1993

Link to publication in University of Groningen/UMCG research database

Citation for published version (APA):

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Download date: 08-12-2018
Summary

Sex differences in foreign language reading comprehension
Over the years, the scores obtained by girls on the Dutch national foreign language examinations, administered at the end of secondary school, have been slightly but consistently lower than those of boys. This dissertation addresses the issue of the possible causes of these differences. Firstly, the observed differences in foreign languages are considered in the wider context of sex differences in academic achievement in general. Moreover, the causes for such differences mentioned in the research literature are reviewed. Subsequently, a number of studies are reported on which were conducted to test the hypothesis that the content of reading comprehension tests result in differences in achievement between male and female students.

Gender differences in academic achievement in the Netherlands
The little data available about gender differences in school achievement in the Netherlands suggests that in the first four years of school, girls tend to outperform boys in almost all subject areas, but from the middle years of primary school on, boys start to overtake the girls in arithmetic. The general achievement test given at the end of primary school shows that by about age 12, girls still do better in language skills, while boys get higher scores in arithmetic. The differences amount to about a quarter of a standard deviation. Boys are also better at tasks involving general knowledge.

In the initial phase of secondary education, this situation changes only slightly. Female students often seem to outperform male students at language skills, including foreign languages; male students score higher on science subjects and in social and economic subject areas (geography, history, economics.) It should be mentioned that, in general, females are better students than males. They have fewer learning disabilities and behavioural problems, they have to repeat a year less often and, on the average, attend higher levels of secondary education.

At the end of secondary school, the picture changes. The superiority of female students in foreign languages appears to have disappeared. Female students exhibit consistently poorer performance in almost all subjects tested on the final examination. The differences may be small, but they are large enough to make female students fail the examination more often than male students. Moreover, female students appear to choose subjects that severely restrict their possibilities for further education and a professional career. Dutch female students seem to underachieve compared to females in other western countries where they often outperform males in a great number of subjects and pass the secondary school final examination more often than their male counterparts.

Possible explanations for sex differences in school achievement
No single explanation can account for all the variance in the differences between females and males in school achievement. In order to explain these differences in performance, researchers have developed complex models to represent the interaction of many variables. These are mostly social and psychological factors, such as possible sex differences in socialization experiences, in beliefs, attributions, expectations and in self-concept. As a result of these differences, female students may have other expectations for success and attach other subjective values to various achievement activities than male students. These usual explanations, however, hardly seem suitable to the observed differences in text comprehension. Differences in aptitude never point in the direction of lower linguistic competence of female students. Neither do negative attributions and low self-esteem appear to interfere in the language domain as far as females are concerned. The study of foreign languages is generally considered to be part of the 'female domain'. In school, female students...
In the search for explanations for sex differences in academic achievement, one aspect is given too little attention, namely, the difference that may be caused by characteristics of the test itself, such as differential item functioning (DIF).

**Item bias in foreign language reading comprehension**

The poor performance of female students in foreign languages is one of the most remarkable sex differences observed in Dutch education. This outcome is contrary to expectations and inconsistent with findings in other countries. In order to find out whether the differences in reading comprehension tests in foreign languages can be attributed entirely to a difference in aptitude, an item bias study was conducted.

An item is said to be biased when random individuals belonging to different subgroups of the same population and having the same underlying ability level do not have the same probability of correctly answering that item.

The French, German and English examinations given at the four types of Dutch secondary schools were subjected to two different DIF analyses, a method based on Item Response Theory and a combination of Item Response Theory and the Mantel-Haenszel Method. The combination method detected 57 items out of 600 items as functioning differently: 48 favouring male students, while 9 favoured female students. These biased items were examined in order to identify common features. Biased items appeared to show similarities in content. Male students did better on items that referred to text passages about technology, machines, motorized vehicles, crime, sports, politics and economics, whereas female students did better at items relating to text passages dealing with family problems, human relations and emotions. In order to control whether these features actually could cause item bias, predictions were made as to the occurrence of item bias in the French, German and English examinations of another year. These predictions were based on criteria concerning the content of text passages formulated after studying the above mentioned items from the 1990 examinations. The predictions appeared to be far from perfect. Although 87 or 90% of the items (the percentage depends on the statistical method used for bias detection) were correctly classified in one of three categories: 'female item', 'male item' and 'neutral' item, the agreement between predicted and statistically biased items was rather low, when corrected for chance. Otherwise, agreement between the results of the two statistical methods that were used was not very good either.

**Text bias**

A possible theoretical explanation of the influence of the content of texts and items on scores in reading comprehension can be found in schema theory, a theory about the way knowledge is represented in memory and the use of this knowledge. It holds that the reader's available background knowledge stored in memory in the form of abstract knowledge structures, the so-called 'schemata', affects the comprehension of new information. The presence of relevant prior knowledge facilitates the processing of information, helps the reader to (re)construct the main idea of a text and to distinguish between the main lines of thought and detail information. Prior knowledge conflicting with new information, on the other hand, can hinder the understanding of new information. Differences in reading comprehension are not necessarily due to differences in aptitude. Prior knowledge may not be the same for all readers and this diversity may influence what is eventually comprehended from the text. Schema theory is rarely used to explain sex differences in school achievement, although it seems appropriate for this purpose. Female and male students differ in interests, hobbies and reading habits. At school, they choose different subjects. So it is likely that they have different (amounts of) knowledge about a certain number of topics. It is conceivable that the text passages selected for the foreign language examinations are more in tune with the knowledge
and interests of male students than of female students. Moreover, male students are generally older than female students when they pass their final examination. It is possible that this average older age facilitates text comprehension.

After the item-bias study, a list of topics that could bring about bias could be made. Yet, it seemed difficult to predict exactly which test items would perform differently for male students or female students. Since the foreign language examinations consist mostly of four or five longer texts, each text being accompanied by about ten multiple-choice questions, it seemed more appropriate to consider a somewhat bigger unit than one item while looking for bias, that is, the items that go with one text. Therefore a study into 'text bias' was conducted. As in the item-bias study, predictions were made and statistical analyses were performed. Test development specialists at Cito (Dutch National Institute for Educational Measurement) responsible for the construction of the foreign language examinations rated texts from the French, German and English examinations according to four criteria, 'male text', 'female text', 'neutral text' or 'unclear'. The classification of texts appeared to be at least as problematic as the prediction of item bias, many texts containing different elements simultaneously from the list of criteria, for example, human feelings and sport in the same text.

For every examination an analysis of variance was conducted on the scores obtained by the candidates for the sets of items belonging to the different texts. The magnitude of the interaction between gender and text score - that is, the average score for the items about one text - was used as a measure of text bias. For 75% of the texts the ratings and the results of the statistical analysis agreed. Texts that favoured female students were more often correctly classified than 'male texts'. The study supports the hypothesis that the topic of texts affects the comprehension scores and that this effect is different for males and females.

A study into the causes of gender difference in foreign language reading comprehension

When comparing biased items and texts, as was done in the item-bias and text bias studies, these items and texts seem to have similarities in content. It seems obvious that the content areas involved belong to the more or less stereotyped interest domains of males and females. In spite of this, it appeared to be very difficult to make predictions as to the occurrence of bias in reading comprehension tests. The last study described in this dissertation was to explore experimentally the relation between text content and sex differences in text comprehension scores. Three questions were formulated regarding this relation.

1. Will the text topic bring about sex differences in foreign language text comprehension? In other words, is it possible to construct foreign language reading comprehension tests that favour male or female students?

2. Are there gender differences in prior knowledge and interest that are relevant for reading comprehension tests?

3. Could possible differences in test scores be explained by such gender differences in prior knowledge and interest?

To answer these questions, an experiment was conducted among students from the final (fourth) form of the lowest level of Dutch secondary education (MAVO) and among students from the next to last (fifth) form from the highest level of secondary education (VWO). The students answered multiple choice items about English texts and completed a number of questionnaires.

Three types of English reading comprehension tests were administered:

The first was a neutral test to assess the level of reading comprehension in English. The other two comprehension tests consisted of 'female' and 'male' texts. These texts were about topics that were supposed to be more familiar to female or male students.

Three questionnaires were designed to obtain measures of prior knowledge and interest. The first part comprised questions about gender, age, educational career and subject choice. The second measure was with respect to the topics. Further, the questionnaires concerning the texts contained two questions on the text genre:

- Technical, political, scientific
- Literature and fiction, History and literature

The results of the second measure and the results of the aforementioned questionnaires showed that the prediction of reading comprehension bias was not always supported. The greatest influence caused this discrepancy with respect to reading comprehension theory for reading comprehension tests. The experience concerning the second question appeared to be very informative in this case. In the last analysis, the figures were far the greatest influence caused this discrepancy with respect to reading comprehension theory for reading comprehension tests. The experience concerning the second question appeared to be very informative in this case. In the last analysis, the figures were far the greatest influence caused this discrepancy with respect to reading comprehension theory for reading comprehension tests. The experience concerning the second question appeared to be very informative in this case. In the last analysis, the figures were far
second measure was developed to assess the students’ reading and television watching habits with respect to the topics of the English texts in the reading comprehension tests. The questions on the third measure asked the students to rate their prior knowledge and interest concerning the topics of the English reading passages.

The results of the statistical analyses provide strong support for a positive answer to the above mentioned research questions. Significant sex differences were found on all tests and questionnaires. On nearly all the 'female' and 'male' reading comprehension tests significant score differences were found between the male and the female students. The responses on the questionnaires showed remarkable sex differences in reading habits and subject choice. The answer to the third research question was that sex differences in scores on 'male' and 'female' reading comprehension tests could be explained in part by differences in reading comprehension level and partly by differences in prior knowledge and interest, mostly differences in reading habits. Male students do read much more informative literature on technical, political and economic subjects, while female students preferred medical topics, literature and fiction, and articles from the female press. Contrary to expectations, subject choice and age did not have any influence on the reading comprehension scores. A remarkable outcome for which it is hard to find an explanation is the relatively greater advantage of male students over females on the 'male texts' compared to the female advantage on the 'female texts'. The greater experience male students seem to have with informative texts may have caused this discrepancy. Another interesting result concerns the possible application of schema theory for reading comprehension in foreign languages. The correlation between reading experience concerning a specific topic and the score on the reading test about a related topic appeared to be very low or nonexistent. The level of reading comprehension in English had by far the greatest influence on the score; the influence of interest and prior knowledge was rather small and indirect.

Results within the limitations of this study support the hypothesis that the choice of the topic and perhaps the type of text influence sex differences in second language reading comprehension. These results should be considered when selecting texts for foreign language examinations. On the other hand, female students should be encouraged to read more informative texts.