Paper Title Comparing Hungarian Students' Reading Development in Continuous and Noncontinuous Text Types

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Session Title International Perspectives on Assessment in the Schools

Session Type Paper

Presentation Date 4/15/2012

Presentation Location Vancouver, British Columbia, Canada

Descriptors Reading, Cognitive Processes/Development, Longitudinal Studies

Methodology Quantitative

Unit Division H - Research, Evaluation and Assessment in Schools

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Introduction

Numerous national and international cross-sectional large-scale assessment programs aim at mapping students' achievement in reading literacy. Although these studies exhibit some methodological differences, a common feature is that reading comprehension is measured in continuous and non-continuous text-types (e.g. *OECD*, 2000, 2010). The latter format implies reading for information where the text organization is fragmented, that is, factual, quantitative, technical, or mathematical information is presented in maps, charts, graphs, time lines, tables, and diagrams, whereas continuous texts entail an underlying organizational and linguistic structure that may be more easily identified and comprehended while reading for literary experience. Data show that Hungarian students perform on a poorer level or more poorly in decoding, understanding and making use of the information conveyed by the non-continuous texts than by their continuous counterparts at each assessment point (*Balázsi* et al., 2010). The reason for this is that students tend to be less familiar with non-continuous text structures often including visual information than with those of narrative and expository texts. Furthermore, the Hungarian National Core Curriculum requires students to be able to construct meaning from such pieces of written information only in the upper grades of elementary school. Therefore, less attention has been paid to reading comprehension of non-continuous texts and the factors influencing students' achievement.

The present study was carried out as the first step of a project aiming to identify developmental patterns and bottlenecks of development in students' reading achievement along continuous and non-continuous text types within the framework of the Hungarian Educational Longitudinal Program (HELP).

The objectives of this study were to
(1) compare test achievement along continuous and non-continuous text types
(2) examine the developmental tendencies along a traditional non-continuous and a mixed text type and
(3) examine the extent to which the text format impacts students' achievement.

Theoretical Background

Reading is a complex process involving several skills. Reading for meaning emerges from a dynamic, complex interaction among the reader, the text, and the context (*Smagorinsky*, 2001). Good readers bring to this interaction their prior knowledge about the topic of the text and their purposes for reading it, as well as their skill in reading, which includes their knowledge about the reading process and the structure of texts (*Pressley* and *Afflerbach*, 1995). Research has shown that understanding and recognizing text structure improves text comprehension (*Williams*, 2005) and helps students understand global ideas, or main theses (*Seidenberg*, 1989). *Dymock* (2005) found that students who face difficulties comprehending informational texts cannot see the basic structure of text. This implies that text type and its unique structure affect students' reading comprehension. Even though more and more emphasis is put on literacy development, data gained from national and international large-scale assessments show that many Hungarian students continue to struggle with acquiring the necessary skills to become successful readers especially when it comes to comprehending informational/non-continuous texts *(OECD, 2001, 2010)*. However, no further analysis has been carried out to map to what extent different non-continuous text types (e.g. lists, mixed

text types, graphs) influence students' achievement and what the underlying factors may be. The main objective of our study is to examine what tendencies students' reading comprehension development show along different non-continuous texts and what the underlying factors influencing further improvement are.

Educational and scientific importance

Reading is an essential skill, which not only helps individuals to become successful and responsible citizens but it also has a significant impact on students' academic achievement in most school domains as well. Students' reading comprehension has been the focus of numerous large-scale student assessment programs over the past decades. In line with these initiatives, in 2003 the first Hungarian longitudinal project was launched with the objective of measuring students' developmental level in elementary school years and identifying the developmental curve and the possible bottlenecks of improvement in reading, mathematical, and science literacy. These studies provide feedback on students' performance along continuous vs. non-continuous text types but they fail to further analyze students' achievement on different subtypes of non-continuous texts. The aim of our study is to complement the results of previous research on students' reading development by carrying out detailed analyses along various non-continuous text types and identifying factors that hinder further improvement. Our results may provide valuable insights for the stakeholders involved in students' reading development and pave the way for further analyses on the developmental tendencies regarding cognitive aspects (information retrieval, interpreting etc.) and text properties across genres.

Methods

Sample and data collection
In this study 3031 students from 127 schools from seven Hungarian statistical regions (males: 51.4%) took part. The longitudinal sample was selected to be nationally representative by region, school type, and socio-cultural status as characterised by parental education. Data collection was carried out in subsequent years in grade 4 and in grade 5 within the framework of the HELP (Csapó, 2007). At the first data collection points there were two subsamples, 1470 students completed test version A, whereas 1561 students completed test version B. At the next data collection point, all students completed the same tests.

Instruments

We analyzed students' test scores on altogether three tests at two assessment points. Two test versions (A and B) were developed in 2006 to serve research purposes other than that of the present study. Both test version A (Cronbach-α=0.894) and B (Cronbach-α=0.866) of the 2006 testing procedure consisted of three subtests including two continuous and a non-continuous text, whereas the 2007 test comprised four subtests with two continuous and two non-continuous anchor texts (Cronbach-α=0.910).
The subtests with continuous texts comprised 20-24 items (Cronbach-α: 0.795; 0.848; 0.852). Two subtests containing non-continuous texts with anchor items were developed to measure students' development at two subsequent assessment points (at the end of grade 4 and 5). One non-continuous subtest (16 items) was a mixed text type (a game manual) in which the continuous format was complemented with a list (Cronbach-α=0.811 and 0.753 respectively) whereas the other subtest of 18 items (Cronbach-α=0.849 and 0.804 respectively) with

questions related to food/nutrition labels can be defined as a traditional non-continuous text. The context of both non-continuous subtests was public.

All subtests contained both closed and open-ended items to better reveal students' understanding of the texts. Furthermore, the cognitive aspects measured by the non-continuous text types were information retrieval and developing and interpretation. The proportion of items requiring students to form an interpretation was 12.5% in the mixed text and 11.11% in the non-continuous text.

Procedure

Data collection was carried out in autumn 2006 and 2007 within the framework of the HELP. Students completed the paper-and-pencil tests during 45-minute classes at school. Teachers supervised the low-stakes procedure.

Analysis and results

Data show that in line with previous research results students performed significantly better on continuous texts both in 2006 and 2007 on all test versions than on non-continuous texts (2006: means at test version A: continuous:73.78%; non-continuous: 60.98%; means at test version B: continuous: 76.47%, non-continuous: 61.94%; 2007: continuous: 71.73%, non-continuous 62.89%). Results indicate a slight improvement in students' achievement on non-continuous texts as well. Nevertheless, development is less balanced if we look at the different structure of non-continuous texts. In order to gain a deeper insight into students' achievement when reading for information, we further divided the non-continuous subtests into a mixed text type and a traditional non-continuous one (a list). Our findings suggest that students had more difficulty in answering questions related to the task on the list (t=35.9; p<0.005).

Data show that students' reading comprehension achievement improved significantly on the mixed text between the two assessment points. In 2007 students' performance was significantly better (grade 4: mean=61.94, SD=24.63; grade 5: mean=70.22, SD=18.76) than in 2006. However, no improvement can be observed in case of the traditional non-continuous text (grade 4: mean=60.98, SD=23.62; grade 5: mean=58.99, SD=21.42).

The correlation coefficient between students' test scores on the mixed and non-continuous texts and between the mixed and continuous texts are high; however, the value of the correlation coefficient is significantly higher between the continuous and mixed text types (r= 0.561 and r=0.558, p<0.01) than between the traditional non-continuous and continuous texts (r=0.298 and 0.500, p<0.01) at all data collection points.

On the one hand, the distinctive organizational structure of the two non-continuous texts may account for the different tendencies in students' development. The mixed text type contains continuous expository piece of information as well as a fragmented part (a list), which are both considered necessary to understand. As students are not only more familiar with continuous texts but also perform better when reading for literary experience, it seems that the expository text facilitates the recognition of the underlying structure and the message of the mixed subtest. As opposed to this, a list lacks cohesive devices which can greatly contribute to text readability.

On the other hand, the national curriculum also provides an explanation for the stagnation of students' achievement when reading the more fragmented list. Retrieving information from lists, graphs, charts and tables only appears as a requirement in other subjects in higher grades of elementary school. Although by grade 4 students' reading comprehension is expected to reach a level when decoding does not hinder the construction of linguistic meaning from written representations of language, students and teachers do not get enough feedback on the

developmental level of their reading skills regarding non-continuous texts because the development of students' reading ability is mainly carried out by means of continuous texts that provide literary experience.

Summary and conclusion

Our results show that text types have a significant impact on students' reading achievement. Text structures with few or no cohesive devices are more difficult to recognize and comprehend for students in lower elementary school grades. The findings of the present paper indicate that text properties are crucial to be considered when developing tests and interpreting test results. Data gained from this study paves the way to examining how texts sharing the same text properties but having different genres affect students' reading achievement.

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