

EARLY GRADE READING FLUENCY AND COMPREHENSION IN MACEDONIA

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Abstract

Assessments of student learning in early grades, with instruments such as the Early Grade Reading Assessment (EGRA), offer an opportunity to determine whether early grade students are developing the fundamental skills upon which all other literacy skills build, and, if not, where efforts might be best directed. This is vital information for improving the quality of education, as the lack of quality assessment data in Macedonia, particularly after the introduction of several educational reforms, made it difficult to provide a clear overview of the current status of early grade student reading performance.

The Foundation for Education and Cultural Initiatives “Step by Step” - Macedonia through the USAID Readers are Leaders Project, implemented in partnership with the education intuitions conducted nation-wide assessment in May 2016 with EGRA instrument of around 8,000 students at the end of Grade 2 and Grade 3 from 335 primary schools in Macedonian, Albanian and Turkish language of instruction.

The results show that even students at the end of third grade do not have developed reading fluency, which directly affects their reading comprehension skills. Some of the examined environment factors show that education of parents, reading skills before starting school, availability of books at home and borrowing books from the library are predictors of better reading fluency and comprehension at school.

The application of EGRA demonstrated that early grade assessments provide critically important information for opening a policy dialogue in order to inform education stakeholders of the current status of students’ performance, to review education programs and policy in the country and to raise awareness about the importance of reading in the early grades for all future learning.

Keywords: Early Grade Reading Assessment, reading fluency, reading comprehension, performance standards

Factors Associated with Reading Fluency and Comprehension of Grade 2 and 3 Students in the Republic of Macedonia

Assessment is an essential element of education used to inform instruction, so the first step in implementing good reading instruction is to determine student baseline performance as they enter the classroom with diverse backgrounds and skills. Assessments of student learning in early grades, with instruments such as the Early Grade Reading Assessment (EGRA¹), offer an opportunity to determine whether early grade students are developing the fundamental skills upon which all other literacy skills build, and, if not, where efforts might be best directed. This is vital information for countries that are working to improve the quality of education in their

¹ Since 2006, EdData II, implemented by RTI International, has developed several instruments including EGRA and EGMA to capture essential, reliable, and valid education data, which were piloted in multiple countries, with funding from both USAID and other donors (www.eddataglobal.org).

schools, such as the Republic of Macedonia, where the lack of quality data on early grade literacy skills, and the below average scores on international assessments, such as PIRLS in 2001 and 2006 (Naceva & Mickovska, 2003), made it difficult to provide a clear overview of the current status of student reading performance in the country, particularly after the introduction of several reforms in primary education (nine-grade schooling, modification of math curricula, etc.).

Most national and international assessments were historically administered as paper-and-pencil tests to students in grade 4 and above. It was not always possible to tell from the results of these tests whether students scored poorly because they lacked the knowledge tested by the assessments, or because they lacked basic reading and comprehension skills. Evidence indicates that learning to read both early and at a sufficient rate (with comprehension) is essential for learning to read well (RTI International, 2015, p.2). Children first need to “learn to read” so that they can “read to learn.” Reading fluency and comprehension are higher-order skills in the reading acquisition process, and they build upon several lower-order, foundational skills such as phonological awareness, alphabet knowledge, decoding, vocabulary, etc., which can be detected through an oral assessment.

There is sufficient research evidence to support the development of specific assessment tools such as EGRA to determine what skills students need in order to become successful readers, regardless of the method by which students are being taught. Early reading skills are acquired in phases; the level of complexity of a language affects how long students need to acquire early reading skills (Torgessen, 1998; Abadzi, 2005 and 2007).

Results from previous EGRA studies conducted in Macedonia (Dimitrovska, 2014 and 2015) suggested that students were taught how to name letters correctly, as a good basis for acquiring reading skills because international evidence shows that letter naming is a good precursor of other skills. However, this high performance in letter recognition and naming did not necessarily translate into good levels of reading fluency for the same language, as automaticity in reading familiar words and short stories was not acquired yet, directly affecting reading comprehension. This is in line with international research demonstrating a strong relationship between reading fluency and reading comprehension.

To gain insight into student foundational reading fluency and comprehension skills, the Foundation for Education and Cultural Initiatives “Step by Step” - Macedonia through the USAID Readers are Leaders Project, implemented in partnership with the education intuitions in Macedonia collected second- and third-grade reading data of 8,000 students in 335 primary schools in Macedonia with the first 2016 nation-wide Early Grade Reading Assessment Study (EGRA). This paper will start with addressing the following two research questions:

- What is the average reading fluency score of second- and third-grade students in Macedonian, Albanian and Turkish language of instruction?
- What is the average reading comprehension score of second- and third-grade students in Macedonian, Albanian and Turkish language of instruction?

Numerous studies have found that reading comprehension correlates to fluency, especially in the early stages and for individuals learning to read in a language they speak and understand. Data from many EGRA administrations across contexts and languages have confirmed the strong relationship between these two constructs (RTI International, 2015, p. 26) and that oral reading fluency is predictive of reading comprehension (ibid, p.42). Because both these skills are measured in EGRA we examine the following research question:

- What is the correlation between reading fluency and comprehension of second- and third-grade students in Macedonian, Albanian and Turkish language of instruction?

We hypothesize that there is correlation between reading fluency and comprehension and if the students have higher ORF scores they would also have better comprehension scores.

Many studies have researched the factors contributing to better fluency and comprehension. PIRLS 2011 study showed that a school's location can have a substantial impact on average reading achievement as it can provide access to important additional resources (e.g., libraries, media centers, or museums). In general, the fourth grade students attending schools in large cities had the highest reading scores (Mullis et al., 2012). Another, important school variable could be the class type, as students can sometimes be grouped together for instructional purposes in multigrade or combination classrooms, due to, for example, having fewer teachers than grade levels or uneven pupil enrollment (Veenman, 1995). Mariano and Kirby (2009) used a quasi-experimental approach to examine the effect of being assigned to multigrade classrooms on students' achievements and found consistently small and negative effects on student achievement, regardless of grade or subject.

A plethora of research on the effects of home environment suggest that a supportive home environment and an early start are crucial in shaping children's reading literacy. In general, parent education seems to have different effects. Mother's higher education improved the academic performance of their child, while father's level of schooling, however, did not.

PIRLS study also showed that home resources also can play an important role in acquiring reading literacy skills, including parents' education, parents often engaged in early literacy activities with their children, having more home resources for learning and books in the home and the children had attended preprimary education. Children had higher reading achievement by the fourth grade if their parents reported that their children started school able to do early literacy tasks (e.g., read some sentences and write some words) (Mullis et al., 2003, 2012).

Stemming from this theoretical framework, a fourth research question examined in this analysis is the following:

- Which school and home environment variables affect the reading fluency and comprehension scores?

Previous EGRA studies (Dimitrovska, 2014 & 2015) suggested that main predictors of student success in reading in Macedonia are: higher education of parents, studying in urban schools, attendance of pre-school, having books at home, borrowing books from the library and reading at home (either independently or with someone else).

We hypothesize that, at the country level, the higher the reading achievement is, the more supportive home environment of the student is, in terms of higher education of parents, attendance of pre-school, reading before starting school, availability of books at home and borrowing books from the library. Furthermore, we predict that reading achievements of students are higher if they attend central (urban) schools and monograde classrooms.

Method

Participants

This paper will use second- and third-grade data from the 2016 nation-wide EGRA Study. The population was defined as all students in Grade 2 and 3 in Macedonian, Albanian and Turkish language of instruction. A multi-staged clustered sampling approach was used. Based on

the number of students, the schools were divided into three clusters: small, medium and large schools; while based on the language of instruction, they were divided into Macedonian, Albanian and Turkish schools. Then, a number of students to be selected from each cluster was defined for Grade 2 and Grade 3, accordingly and then based on the lists of Grade 2 and 3 students from each school the participating students were selected randomly.

In second grade, 2,442 students participated in Macedonian, 1,173 in Albanian and 153 in Turkish language of instruction; in third grade 2,448 students participated in Macedonian, 1,210 in Albanian and 160 in Turkish language of instruction. The distribution of students in the sample per language of instruction, school location, gender and region are presented in Graph 1 and 2 (please see Annex 1).

Measures

The Early Grade Reading Assessment (EGRA), as one-on-one oral assessment instrument, measures individual student progress in reading. EGRA adapted to the curriculum in the Republic of Macedonia, is comprised of six tasks in four literacy areas: Letter Knowledge, Familiar Word Reading, Reading Fluency (two tasks) and Reading Comprehension (two tasks). This paper will focus on reading fluency and comprehension as two dependent variables.

To measure the oral reading fluency (ORF), children are given two short written passages on a familiar topic and asked to read it out loud “quickly but carefully.” The oral reading fluency subtask is timed and measures speed and accuracy in terms of the number of correct words read per minute. Three categories of variables are electronically collected: total correct words read, total incorrect words, and time remaining.

The correct_words_per_minute (cwpm) rate is calculated using the following formula:

$$\text{ORF_cwpm} = \frac{\text{Subtask_score}}{\text{Time given for subtask-subtask_time_remain}} \times 60$$

The total ORF score for each student is calculated as the average of two scores for each reading fluency subtask.

EGRA measures reading comprehension based on the comprehension questions children are asked (ten for each passage). Data collection software prompts the assessor to ask only questions related to the text the child has read, so students were assessed only on the number of reading comprehension questions they answered in the section of the passage they were able to read. The list of comprehension questions includes ones that can be answered directly from the text as well as inferential questions requiring students to combine knowledge and experience from outside the text to respond correctly.

Students are scored on the number of comprehension questions answered acceptably, with a final score variable calculated as a share of total questions asked. Although this benchmark may vary by context, in general, students are considered to be able to read fluently, with comprehension, if they can answer 80% or more of the reading comprehension questions correctly. To calculate this, a new summary variable is created: read_comp_score_pc80, which is coded to 1 if the reading comprehension score is 80% or higher; otherwise it is set to 0.

The independent variables were several variables measured through the background questions the assessed students answered during the administration of EGRA:

- Type of the school the student attends (central or satellite): satellite schools are usually located in rural areas, so even if the central school is listed as urban, the data of the students from satellite schools are considered as rural;
- Type of classroom (regular or multigrade): multigrade classrooms consist of several classes studying together combined differently, either two grades or in some cases even five grades together;
- Attendance of preschool (yes or no);
- Availability of additional books at home (yes or no);
- Reading before starting school (yes or no);
- Borrowing books from library (yes or no).

Additionally, two other independent variables were analyzed: gender of the student and education of parents/ guardians (both mother and father - primary or less, secondary or higher and more).

Procedure

The data collection was carried out by 850 trained assessors, comprised of pedagogues, psychologists and early grade teachers from May 9 to 31, 2016 in 335 primary schools. Based on the language of instruction, the instrument was administered in 265 schools with Macedonian, 133 with Albanian and 39 schools with Turkish language of instruction. All assessors were trained for electronic data collection using tablet computers and Tangerine application for recording data electronically and submitting them to a cloud based database. Prior to the study, each school received laminated student stimuli sheets and lists of students to be assessed. As quality assurance of data collection process is crucial for obtaining valid and reliable data, 71 observers were deployed to monitor the data collection process and ensure that assessors follow the rules of EGRA administration and use of Tangerine.

Results

The results on the reading fluency showed that the achievements of students from both second and third grade in all three languages of instruction are below the US oral reading fluency norms (Hasbrouck & Tindal, 2006) taken as a benchmark for comparison purposes.

These low ORF scores are then translated into low reading comprehension, as the average performance of students in both grades and three languages did not reach the internationally accepted benchmark of 80% of answered questions as indicator of the comprehension (see Table 1 in Annex 2).

As hypothesized, when we examined the correlation between the oral reading fluency and comprehension scores, the Pearson correlation is significant at the 0.01 level for all three languages of instruction in both grades (see Table 2 in Annex 2).

The influence of independent variables on the oral reading fluency score and reading comprehension was tested with several statistical methods: t-test, one-way ANOVA and regression analysis.

The results show that the education of parents, both mother and father, significantly affects the oral reading fluency and comprehension across both grades and in all languages of instruction (see Annex 3 for results), which is in line with our hypothesis.

The effect of other variables on ORF and reading comprehension performance varies according to grade and language of instruction.

For the Macedonian language of instruction, in Grade 2, students that started reading before going to school read significantly more fluently, while in Grade 3 borrowing library books significantly affects their reading fluency (see Table 3 and 4 in Annex 2). Regarding the reading comprehension, students in both grades that attended pre-school, have books at home and borrow library books have significantly better results in understanding the text (see Table 5 and 6 in Annex 2).

For the Albanian language of instruction, in Grade 2, students that went to pre-school, started reading before going to school, have books at home and borrow library books can read more correct words per minute, but this is not statistically significant. The same applies for Grade 3 students, where only attendance of pre-school is statistically significant (see Table 3 and 4 in Annex 2). In the area of comprehension, students that did not attend pre-school, did not start reading before going to school, did not have available books at home and did not borrow library books have significantly lower reading comprehension score in both grades (see Table 5 and 6 in Annex 2).

For the Turkish language of instruction, the reading skills before starting school and borrowing library books have significantly increased reading fluency results in Grade 2, while availability of books at home in Grade 3 (see Table 3 and 4 in Annex 2). For the reading comprehension, second graders that have no books at home have significantly poorer results, while for third graders those having books at home have significantly better results (see Table 5 and 6 in Annex 2).

When we used regression analysis to look into the factors associated with student reading skills in both grades and all languages of instruction, it seems that the most relevant factors associated with developing reading fluency skills are the reading skills developed before going to school and availability of books at home. The books the students have at home are also highly associated with the reading comprehension (see Annex 4).

Discussion

Most of the findings of our study fit in with previous literature and theory. However, some of the factors examined to be associated with the reading fluency and comprehension did not give straightforward connection in both grades and three languages of instruction.

However, below the average results in oral reading fluency and comprehension, particularly at the end of third grade, highlight multiple reasons why children may not acquire the necessary reading skills at school, such as: insufficient resources at school and home, insufficient learning time (e.g., during and/or after school), teachers/principals have little incentive to improve learning, rigid and overly ambitious curricula which do not match the learning levels of the students, teachers do not personalize instruction, low-performing students do not get extra help (Floretta & Strathmann, 2016).

There are some critically important areas in which interventions will be needed:

On a school level, teachers should spend more time of the instruction on shared and independent reading as appropriate, ensuring that students have time to practice their new skills in reading to increase their fluency and accuracy. Teachers should tailor the classes based on the needs and results of their students. They should expose their students to different types of inferential questions from an early age in order to be able to learn to express their own opinion,

interpret facts or judgment and increase their comprehension skills. Training of teachers remains a complex task but it must be assumed that teachers learn best by doing and interacting with other professionals. This implies that teacher training should be organized around modeling and practice, and that having brief trainings with follow-up and refresher meetings is more effective than longer trainings. Regular professional development through training and other activities should fill a demand for instructional practice and support. Finally, reading progress in the classroom should be monitored a few times per year for early detection of ‘at risk’ children having reading difficulties and providing targeted support and remedial instruction for struggling readers.

In the home environment, children should have access to different reading materials at home, while parents should be encouraged to be engaged in early literacy activities with their children, such as: reading books, telling stories, singing songs, playing with alphabet toys, talking about things done, talking about things read, playing word games, writing letters or words, and reading aloud signs and labels. However, the lower level of education of parents, lack of pre-school services in rural areas and limited support from the community at large are not in favor. In these areas, the school should play the critical role by providing workshops for the parents and investing in a small classroom libraries. This is a great option so that children can have access to books and magazines as part of their reading lessons and activities, but also making it possible for students to be able to take books and other resources at home.

On a policy level, dialogue should be open for reviewing education programs and policy in the country, matching the language and mathematics curriculum in early grades and establishing national reading performance measures in Macedonian, Albanian and Turkish language for the early grade students and exploring to what extent second and third grade students reach these standards.

On a national level, a literacy campaign should be launched to raise awareness about the importance of reading in the early grades for all future learning. Any reading intervention should particularly target the children from rural areas and satellite schools. Publishing companies should be also involved through public-private partnerships to provide books and literacy resources to schools, libraries and even most disadvantages families, particularly in languages that children understand.

One limitation of the study is that the assessment was done by school members employed in the same schools where students were assessed. Despite the training and deployment of observers it was difficult to eliminate the subjectivity of assessors. A recommendation for the future study is to hire “professional” assessors to conduct the assessment.

It is also recommended in a follow-up study to explore the number of years students had in preprimary education, participation in literacy related activities at home, the frequency of reading and deeper exploration of availability of print material at home, as in this study we relied on student self-reports.

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