

READING FLUENCY: NORMATIVE DATA FOR THE ROMANIAN-SPEAKING POPULATION

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Abstract

The purpose of this study was to establish reading fluency norms in the Romanian language for first grade students at the end of the school year using the PEAFIC (Proba de evaluare și antrenare a fluenței în citire/ The Assessment and Training of Reading Fluency Instrument, Bodea Hategan & Talas, 2014). A representative sample of 1977 first grade students (age between 7 and 8 years old) was assessed: girls ($N_g=954$) and boys ($N_b=1023$) from different counties of Romania ($N_c=11$), attending rural ($N_r=385$) and urban ($N_u=1592$) elementary schools. Oral reading fluency norms were established on the linguistic structure of the words (monosyllabic, disyllabic, three syllable words and text words). The results of this study offer a new perspective on the reading fluency levels at the end of the first grade and will help teachers and specialists to identify students at risk for dyslexia and to start effective early intervention programmes to improve reading fluency.

Keywords: *reading fluency, oral reading fluency norms, reading abilities, dyslexia, poor reading, fluent readers.*

Introduction

Reading is a very complex academic skill that the students achieve throughout the first grades; this skill influences the academic progress of the students over the years. But there are only few recent studies in the Romanian language regarding reading normative data in elementary grades for teachers to follow and try to adapt different reading materials for elementary grades.

Since 2012, the Romanian school system has changed a lot, children start school when they are 6 years old in a preschool class, and they start first grade when they are 7 years old. With this major change, the curricula and the teaching literacy strategies have changed and there are no research works at the national level to offer specific information about reading skills.

Reading Fluency

Reading fluency or oral reading fluency definitions include two key words: *accuracy* and *speed*. In its report (*National Reading Panel*, 2000, p. 3-1), the National Institute of Child Health and Human Development considers that “*fluent readers can read text with speed, accuracy, and proper expression*”.

The definition of reading fluency changed over the years; some definitions include comprehension while others do not address the comprehension stage. For example, early researches (LaBerge & Samuels, 1974; Samuels, 1979; Dowhower, 1997) define reading fluency as the ability to recognise words rapidly and accurately and Harris et al. (1995, p. 85) define the same concept as: “*A reader whose performance exceeds expectation with respect to age and ability; while an independent reader; any person who reads smoothly, without hesitation and with comprehension.*” The latter definition for reading fluency includes the following components: accuracy, speed, prosody and comprehension. Some authors (Binder et al. 1996) the practice of precision teaching set the stage for discoveries about relations between behavior frequency and specific outcomes, notably retention and maintenance of performance, endurance or resistance to distraction, and application or transfer of training. The use of frequency aims in instructional programming by Haughton and his associates led to formulation of empirically determined performance frequency ranges that define fluency. Use of fluency-based instructional methods has led to unprecedented gains in educational cost effectiveness, and has the potential for significantly improving education and training in general. This article traces the development of concepts, procedures, and findings associated with fluency and discusses their implications for instructional design and practice. It invites further controlled research and experimental analyses of phenomena that may be significant in the future evolution of educational technology and in the analysis of complex behavior. Fluency-based education and training programs have produced some of the most dramatic results in the history of behaviorally oriented instruction. During the 1970s, the Precision Teaching Project in Great Falls, Montana (Beck, 1979; Beck & Clement, 1991; Kubina Jr., 2005) discuss about endurance and reading fluency, while the accuracy and the rate are important factors that influence reader’s endurance (Abadiano & Turner, 2005). The Qualitative Reading Inventory- 3 (Leslie et al., 2001) presents three accuracy levels for readers: independent level (98% accuracy), instructional level (90-97% accuracy) and frustration level (less than 90% accuracy).

The relation between reading fluency and reading comprehension is highlighted in different research studies. One of these (Fuchs et al., 2001) considers that reading fluency is an important component of reading comprehension. Other researchers (Adams 1990) learning and reading -- The nature of learning -- On the goals of print instruction: What do we want students to learn -- Learning how to read -- On teaching phonics first -- Phonological prerequisites: Becoming aware of spoken words, syllables and phonemes -- Learning about print -- To reading from writing.”, “author” : [{ “dropping-particle” : “”, “family” : “Adams”, “given” : “Marilyn Jager”, “non-dropping-particle” : “”, “parse-names” : false, “suffix” : “” }], “edition” : “1st”, “id” : “ITEM-1”, “issued” : { “date-parts” : [[“1990”]] }, “number-of-pages” : “485”, “publisher” : “MIT Press”, “title” : “Beginning to read : thinking and learning about print”, “type” : “book” }, “uris” : [“http://www.mendeley.com/documents/?uuid=ea6655b6-2777-3962-a80b-3740a6e25c49”] }, “mendeley” : { “formattedCitation” : “(Marilyn Jager Adams 1990; Adams 1994)as Adams immersed herself in the topic, more of a ‘What we know about basic processes and instructional practices in word and letter identification and early reading.’”

And that is exactly how I view the book you are reading\u2014as the most complete review, within a single cover, of our expanding knowledge of: the history of the English alphabet, the controversies surrounding phonics instruction, issues and research in early reading instruction, basic perceptual and reading processes, the processes involved in identifying sounds, letters, words and meaning, and the processes involved in learning to read. (foreword conclude that fluent readers can concentrate more on comprehension if the readers do not spend a lot of time on the decoding process.

Reading Fluency Assessment Tools

Reading fluency can be measured using a timer and different instruments (lists with letters, lists with words, lists with pseudo-words, lists with expressions, lists with sentences, lists with paragraphs or texts) and the teacher records the number of correct sounds or words the students can read in a well-defined period of time. Most tests use the one minute reading session to record the number of sounds or words the student can read. Deeney (2010) concluded that *One Minute Measures* proved to be an effective tool for teachers working with both typical and struggling readers.

Another author (Speece & Case, 2001) present different reading tasks to improve reading fluency. The *Letter Sound Fluency* (LSF) is a probe where the teacher records the number of correct letter sounds the student identifies per minute (LSF) (Speece & Case, 2001). The same authors develop the *Oral Reading Fluency* probe and the teacher records the number of correct words the student can read in a text per minute. The length of a text depends on the student's grade level: for the first grade students the text has approximately 150 words and for the second grade students the text has approximately 200 words.

The Rapid Automatized Naming (further RAN) is another probe where the teacher records the number of seconds the child needs to name six familiar objects out of 36 objects displayed in four lines.

Also, the Test of Word Reading Efficiency (Torgesen et al., 1999; Torgeson et al., 2009) measured the number of words the student could read in 45 seconds. The authors used different lists of words with increasing the difficulty level.

The Oral Reading Fluency Scale from the National Assessment of Educational Progress (further NAEP) is a tool first developed in 1992 (White, 1995). This scale, up-dated in 2002, has four reading fluency levels starting with the word-by-word to meaningful phrase groups with expressive interpretation.

Recently, Biancarosa and Cummings (2015) and to link these findings to practical uses of reading curriculum-based measurement (R-CBM underline the importance of the reading curriculum-based measurement (R-CBM) tools in order to offer the best and most appropriate data about reading skills.

Oral Reading Norms

There is a real need for all teachers to have the reading norms for each grade level. Most of the research works focus on the English language, but these norms cannot be assumed by other languages. The specific structure of each language, the specificity of the teaching methods to teach reading, the curriculum structure are important factors that can influence the reading norms for each grade level (Griffith & Rasinski, 2004; Hasbrouck & Tindal, 2006; Gagliano et al., 2015).

The following paragraphs present some reading norms developed for the English language readers, in order for these reading fluency norms to be considered in discussing the data collected for the Romanian population, as we considered that transcultural studies and research are very relevant in the speech and language field and they can reveal several transcultural invariants related with speaking, reading and writing skills. *Typical Oral Reading Rates*, grades one to six compress the following norms: grade one, 30–70 words; grade two, 50–100; grade three, 70–120; grade four, 90–140; grade five, 100–150; grade six, 110–150 (Barr et al., 1995; Baar et al., 2007).

The national oral reading fluency norms for students of the first to sixth grade, in three different periods of time: autumn, winter and spring, are presented by Hasbrouck and Tindal (2006). At 50 percentile for grade one, the norms are 23 in winter and 53 in spring; grade two, 51 in autumn, 72 in winter, 89 in spring; grade three, 71 in autumn, 92 in winter, 107 in spring; grade four, 94 in autumn, 112 in winter, 123 in spring; grade five, 110 in autumn, 127 in winter, 139 in spring; grade six, 127 in autumn, 140 in winter, 150 in spring.

Other fluency goals for student grades of the first to sixth at the end of the school year are available (Shanahan, 2006). The norms are: grade one, 60 words per minute (wcpm); grade two, 90 wcpm; grade three, 120 wcpm; grade four 130 wcpm; grade five, 140 wcpm; grade six 150 wcpm.

Intervention Strategies to Improve Oral Reading Fluency

Over the years, teachers tried to create different strategies to improve reading fluency. Some authors (Lo et al., 2011) highlighted the following intervention strategies used in repeated reading: error correction, adult modelling, performance cueing and feedback, preview and practice of isolated words and repeated reading training materials.

The “*repeated reading passages*” is a very popular strategy included in many intervention programmes and demonstrated to be efficient in different research studies (Samules, 1979; Dowhower, 1997; Kuhn & Stahl, 2003; Ardoin et al., 2008; LeVasseur et al., 2008). Ardoin, Eckert & Cole (2008) demonstrate significant differences on oral reading fluency in intervention passages when using the *repeated reading* intervention compared to the *multiple exemplars* for students in the second and fourth grade.

In their meta-analysis, the authors (Morgan & Sideridis, 2006) present the importance of motivational stimulus using the repeated reading strategy. Goal settings and performance feedback are important motivational stimuli included in the repeated reading programme. Direction discrimination training and digital image enhancement improved reading fluency not only for children with dyslexia, but also for typical readers (Lawton, 2008) which means they are twice as likely to drop out of school. Previous research has found that children who are slow readers have reduced contrast sensitivity for detecting the direction of movement, and that improving their movement contrast sensitivity by training with sinusoidal gratings moving relative to fixed background gratings significantly increases their reading fluency. Since observers having reduced contrast sensitivity show much faster reading speeds when text is sharpened with digital filters, it is likely that children will also read filtered text more quickly than unfiltered text. Methods: Orientation discrimination contrast thresholds were measured for both dyslexic and normal readers in grades kindergarten through third grade and used to construct individualized digital image enhancement filters. Computer-based reading speeds were measured for both unfiltered and filtered grayscale text before and after training on direction discrimination. Following training, reading speeds for both unfiltered and filtered equiluminant colored text were measured as well. Results: Reading rates were twice as fast

when utilizing filtered text to compensate for losses in orientation discrimination contrast sensitivity compared to unfiltered text, both before and after direction discrimination training. Both filtered and unfiltered colored text was read at least 30% more slowly than filtered or unfiltered equiluminant grayscale text. The effects of training on direction discrimination were also significant for both dyslexic and normal readers ($p < 0.008$). In addition (Keehn, 2003), there are alternative methods to improve reading fluency: rereading, modelling, explicit instruction and a manageable text.

In the last decades, different technologies were involved in both teaching in general and in different intervention programmes for struggling readers. Feedforward video self-modelling proves to be an effective strategy to improve not only reading fluency, but also comprehension, accuracy and reader self-perception (Robson et al., 2015).

Aim and Objective

This research is based on the following main objectives, in order to establish norms regarding reading fluency for Romanian speakers:

- to compute normative values for reading fluency in first graders with typical development;
- to compare the values obtained, based on linguistic criteria, namely to establish if reading fluency of words is dependent either on the syllabic composition or the fact that the words are presented isolated or as parts of a text;
- to set up some diagnostic values for reading fluency abilities for Romanian students at the end of the first grade;
- to determine if there are any gender and age differences regarding reading abilities in first graders;
- to investigate the association between the performance in two different subjects (Romanian Language and Mathematics) and first graders' reading fluency abilities;
- to identify the differences between children in the first grade, based on the environment/ setting they are coming from (rural or urban).

Research Design

The data was collected in compliance with a specified procedure. Researchers paid attention to the selection of the material used for assessment, the training of the people involved in data collection and the manner the obtained data was collected and registered.

Method

Participants

The selection criteria for the participants were:

- to have a typical development (children with disabilities were not included in the research study);
- to be enrolled in the first grade

The initial number of participants in the research was 1977, coming from 11 counties around the country: Bistrița-Năsăud (BN); Sibiu (SB); MS (Mureș); Caraș-Severin (CS), Timișoara (TM); Sălaj (SJ); Cluj (CJ); Suceava (SV); Vâlcea (VL); Dolj (DJ); Maramureș (MM). Thus, the data was collected at the national level. This aspect is relevant for our research as the norms we intend to offer at the end should to be representative for the whole Romanian population.

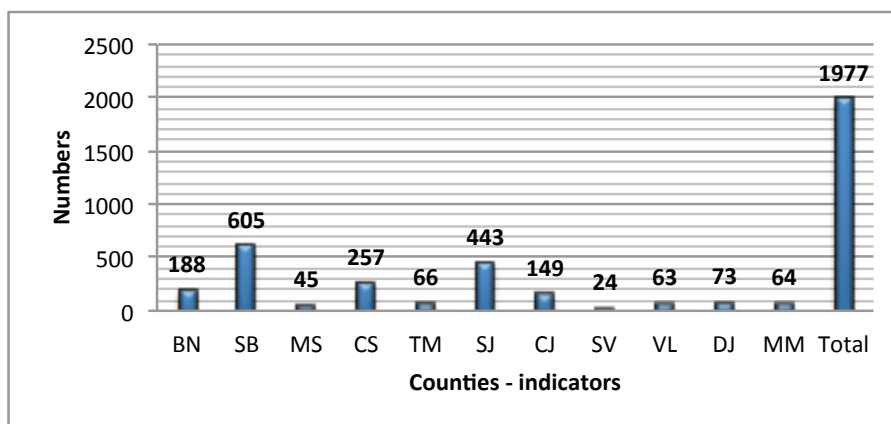


Fig. 1. Descriptive statistics regarding the county the participants are coming from

The group of participants in the research can be described according to children's age (7 and 8 years old), gender (male and female) and the environment they are coming from (urban or rural area). The characteristics of the group are presented in Table 1.

Table 1. Descriptive statistics of the group for the participants in the research

Age			Gender			Environment		
	Frequency	Valid percent		Frequency	Valid percent		Frequency	Valid percent
7	829	41.9	M	1023	51.7	urban	1592	80.5
8	1148	58.1	F	954	48.3	rural	385	19.5
Total	1977	100.0	Total	1977	100.0	Total	1977	100.0

Analysing the data from the Romanian National Institute for Statistics (*Recensământul populației și al locuințelor*, 2011), we can conclude that the group of participants in our research is representative for the Romanian population based on gender (the number of female children is higher than the number of male children for around 3%, the aspect also illustrated in the composition of our group). The representativeness is not reached regarding the environment the participants are coming from. In order to reach this goal of representativeness, the collected data should contain almost equal rates from urban and rural participants. An explanation for not being able to collect more data from rural areas is that speech and language therapists in Romania are mostly working in urban areas and a small number in rural areas. As the professionals trained to assess the children were speech and language therapists, collecting data from rural areas was very difficult.

Instruments and Procedure

Material Used during the Assessment Sessions

The materials used during the assessment sessions were selected from the PFEAC, Proba de evaluare și antrenare a fluenței în citire/ The Assessment and Training of Reading Fluency Instrument (Bodea-Hațegan & Talaș, 2014; Bodea Hațegan & Talaș, 2015). The materials used consisted of: one list of monosyllabic words, one list of disyllabic words, one list of three-syllable words and one list with a text (Annex 1). The linguistic material collected in the PEAFC was selected following carefully the linguistic features of the Romanian language.

Thus, the linguistic material can be considered as representative/ typical for the Romanian language. The selection of the four specific lists used in the assessment of each participant was performed randomly from the whole PEAFc.

Training the Data Collectors

Speech and language therapists were involved directly in collecting data for the current research. They participated in training sessions regarding the the PEAFc using procedure. One specific training session regarded the discussion of the summary report the professionals had to fill in after collecting the data (Table 2).

Table 2. Structure of the report summary

No.	Initials	Age	Gender	Environment		Romanian language Grade Sem. I	Mathematics Sem. I	Monosyllabic words		Disyllabic words		Three syllables words		Text		Disyllabic words		
			M	F	Urban	Rural			correct	wrong	correct	wrong	correct	wrong	correct	wrong	correct	wrong

The report was used in order for the data to be collected in a unitary manner as there were 28 speech and language therapists who collected data for the research.

Procedure

The data was collected within a short period of time, from 15 April to 30 May, 2015. Speech and language therapists involved in the research were helped by children's primary teachers to organise the assessment sessions. Each of the four lists was supposed to be read by children in one minute, speech and language therapists were asked to fill in the report summary of the number of the words read correctly and the number of the errors that the students made. After the data was collected, speech and language therapists sent the reports to the researchers. The collected data was converted to the SPSS 17 data base and a statistical analysis was performed.

Results¹

In order to reach the first objective of the study, descriptive statistics tools (from SPSS 17) were used, and the results obtained are illustrated in Table 3.

¹ The descriptive frequencies and the norms were also included in the second version of the book coordinated by Bodea Hațegan and Talaș (2016), but in the Romanian language. The data will also be included in the present article to ensure a complete perspective for the readers.

Table 3. Romanian reading fluency norms

	N	Minimum	Maximum	Mean	Std. Deviation	Kurtosis	
	<i>Statistic</i>	<i>Statistic</i>	<i>Statistic</i>	<i>Statistic</i>	<i>Statistic</i>	<i>Statistic</i>	<i>Std. Error</i>
Mono_Correct	1977	0	120	43.96	23.962	1.404	.110
Dis_Correct	1977	0	120	40.73	23.264	2.042	.110
Tri_Correct	1977	0	120	29.22	20.545	6.737	.110
Text_Correct	1977	0	158	44.20	30.536	2.409	.110
Valid N (listwise)	1977						

Based on the values of the skewness and kurtosis parameters, our results did not match a normal distribution and we found that there were multiple outliers, which were eliminated from further analysis. Following this operation, the normality assumption of the data was reached and the subsequent norms are presented in Table 4.

Table 4. Norms for Romanian reading fluency without the outliers

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	<i>Statistic</i>	<i>Statistic</i>	<i>Statistic</i>	<i>Statistic</i>	<i>Statistic</i>	<i>Statistic</i>	<i>Std. Error</i>	<i>Statistic</i>	<i>Std. Error</i>
Mono_Correct	1905	0	98	41.21	19.658	.314	.056	-.240	.112
Dis_Correct	1895	0	89	37.66	18.220	.252	.056	-.310	.112
Tri_Correct	1881	0	63	25.73	13.007	.335	.056	-.240	.113
Text_Correct	1861	0	95	38.74	21.516	.407	.057	-.440	.113

Results were also grouped into quartiles, so that they reflect some milestones in reading fluency and were summarised in a diagnostic chart (Table 5). The chart underlines diagnostic values representing milestones for high risk to absence of risk in reading fluency for children at the end of the first grade.

Table 5. Milestones in reading fluency

Grade	Linguistic Material	Diagnosis values
I	Monosyllabic words	≤ 25—with high risk rate
		26 < 40—with low risk rate
		> 40—no risk
I	Dissyllabic words	≤ 24— with high risk rate
		25 < 37— with low risk rate
		> 37—no risk
I	Three syllable Words	< 16— with high risk rate
		16 < 25— with low risk rate
		> 25—no risk
I	Text	≤ 23— with high risk rate
		23 < 36— with low risk rate
		> 36—no risk

In order to establish if reading fluency of words is dependent either on the syllabic composition or on the fact that the words are presented isolated or as parts of a text, correlational and comparison tests were applied (after the distribution of the results was normalized by eliminating the outliers).

Table 6. Mean values and standard deviations for the experimental group without outliers

	Mean	N	Std. Deviation	Std. Error Mean
Mono_Correct	40.92	1894	19.333	.444
Dis_Correct	37.64	1894	18.202	.418
Tri_Correct	25.66	1877	12.933	.299
Text_Correct	38.71	1860	21.496	.498

Table 7. Correlations between the numbers of the correctly read words dependent on the linguistic material used

		Mono_Correct	Dis_Correct	Tri_Correct	Text_Correct
Mono_Correct	Pearson Correlation	1	.924**	.874**	.856**
	Sig. (2-tailed)		.000	.000	.000
	N	1905	1894	1877	1860
Dis_Correct	Pearson Correlation	.924**	1	.900**	.875**
	Sig. (2-tailed)	.000		.000	.000
	N	1894	1895	1871	1857
Tri_Correct	Pearson Correlation	.874**	.900**	1	.873**
	Sig. (2-tailed)	.000	.000		.000
	N	1877	1871	1881	1845
Text_Correct	Pearson Correlation	.856**	.875**	.873**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	1860	1857	1845	1861

All the correlations were highly significant ($p \leq .01$ level). The highest correlation was obtained between the number of monosyllabic and disyllabic words correctly read ($r = .924$), while the lowest correlation value was obtained between the number of monosyllabic words and the words from the text read correctly ($r = .856$). These results underline the fact that monosyllabic and disyllabic words do not require very different fluency reading skills, compared with three syllable words or text words.

Comparison between means was performed using Student's t test, in order to establish the statistical significance of differences in reading fluency skills dependent on the linguistic material read (Table 8).

Table 8. Comparisons between the number of correct words read

		Paired differences					T	Df	Sig. (2-tailed)
		Mean	Std. deviation	Std. error mean	95% Confidence interval of the difference				
					Lower	Upper			
Pair 1	Mono_Correct - Dis_Correct	3.277	7.420	.170	2.943	3.612	19.222	1893	.000
+Pair 2	Mono_Correct - Tri_Correct	14.910	9.983	.230	14.458	15.362	64.709	1876	.000
Pair 3	Mono_Correct - Text_Correct	1.531	11.105	.257	1.026	2.036	5.947	1859	.000
Pair 4	Dis_Correct - Tri_Correct	11.582	8.331	.193	11.204	11.960	60.135	1870	.000
Pair 5	Dis_Correct - Text_Correct	-1.724	10.439	.242	-2.199	-1.249	-7.118	1856	.000
Pair 6	Tri_Correct - Text_Correct	-13.255	12.035	.280	-13.804	-12.705	-47.307	1844	.000

Comparison test showed significant results between the numbers of the correctly read words, underlining the fact the nature of the linguistic material significantly influences reading skills.

The same results are obtained, at the general level by using the analysis of variance of the differences (by using One-way Anova).

Table 9. One way Anova for words correctly read

	Sum of squares	Df	Mean square	F	Sig.
Between Groups	268942.417	3	89647.472	265.663	.000
Within Groups	2543680.145	7538	337.448		
Total	2812622.562	7541			

Further analysis of the differences was performed based on gender, age, environment and school grades of the participants. A summary of the results is presented in Table 10.

Table 10. Differences in reading fluency performance, depending on gender, age and environment

Type of material	Gender (mean, SD)		T	Age		T	Environment		T
	Male	Female		7	8		Urban	Rural	
Monosyllabic	41.3 (20.5)	41.1 (18.7)	.23	41.6 (19.3)	41 (19.9)	.66	urban	43.1 (19.1)	8.3**
							rural	33.9 (20.2)	
Disyllabic	37.6 (18.9)	37.8 (17.5)	-.20	37.8 (17.8)	37.6 (18.5)	.19	urban	39.5 (17.8)	9.01**
							rural	30.2 (18.1)	
Three syllable	25.5 (13.5)	25.9 (12.5)	-.66	25.8 (12.4)	25.7 (13.4)	.19	Urban	27 (12.8)	8.5**
							Rural	20.7 (12.8)	
Text	38.5 (21.9)	39 (21.1)	-.53	38.6 (21)	38.8 (21.9)	-.19	Urban	40.7 (21.3)	7.8**
							Rural	31 (20.8)	

*significant, **highly significant

According to our data, the only relevant demographic factor contributing to performance in reading fluency is the child's environment (with children coming from rural areas having much lower performance, than those from urban areas). We tested the correspondence between school performance, reflected in the children's grades (the Romanian language and mathematics), and reading fluency. The results for differences in reading fluency, depending on the children's grades in the Romanian language are presented in Table 11.

Table 11. Difference in reading fluency, depending on the Romanian language grades

Type of material	Grade	mean(SD)	F(sig.)
Monosyllabic	FB ¹	46.9 (17.8)	237.97**
	B ²	28.2 (12.5)	
	S ³	15.2 (15.1)	
	I ⁴	4 (4.9)	
Disyllabic	FB	42.9 (16.4)	238.4**
	B	26.1 (12.5)	
	S	12.8 (12.5)	
	I	3.3 (4.7)	
Three syllable	FB	29.4 (11.9)	216.16**
	B	17.7 (8.9)	
	S	8.8 (8.5)	
	I	1.8 (3.5)	
Text	FB	44.7 (19.8)	193.12**
	B	25.7 (14.9)	
	S	12.6 (16.5)	
	I	1.5 (3)	

*significant **highly significant

¹very good, ²good, ³sufficient, ⁴insufficient – Romanian grading system for first to fourth grades

As it is presented in Table 11, the differences in children's performance in the Romanian language are reflected in their reading fluency skills, so the reading fluency is highly associated with their school performance. Post-hoc analysis performed on our data prove the significance of differences between all the grades, thus proving that the lower the child's school performance in the Romanian language, the lower the performance in reading fluency.

Next, we tested the significance of the differences in mathematics depending on the children's reading fluency. The results are shown in Table 12.

Table 12. Difference in reading fluency, depending on the mathematics grades

Type of material	Grade	mean(SD)	F(sig.)
Monosyllabic	FB ¹	46.1 (17.9)	184.56**
	B ²	29.34 (15.3)	
	S ³	15.2 (14.7)	
	I ⁴	6.6 (6.9)	
Disyllabic	FB	42.3 (16.5)	189.14**
	B	26.6 (14.3)	
	S	13.3 (13.6)	
	I	5 (5.9)	
Three syllable	FB	28.9 (11.9)	177.40**
	B	18.2 (10.4)	
	S	8.4 (7.9)	
	I	3.4 (4.5)	
Text	FB	44 (20)	162.19**
	B	25.9 (16.1)	
	S	12.5 (15.9)	
	I	4.6 (7.4)	

*significant **highly significant

¹very good, ²good, ³sufficient, ⁴insufficient – Romanian grading system for first to fourth grades

The results detailed in Table 12 show that the differences obtained in the children's mathematics performance are reflected in their performance in reading fluency. Also, the post-hoc analysis of our data shows that those children who are low in their school performance in mathematics are also low in their reading fluency performance.

Discussions

The results demonstrate that the average number of read words per minute in the Romanian language is 35.83 (this average value is expressed for the overall reading fluency (Further ORF), after the elimination of the outliers. Before eliminating, the outliers and the ORF mean value = 39.52. The obtained values prove that ORF in the Romanian language at the end of the first grade has a mean value between 35 and 40 words per minute, a value comparable with the reading rates indicated by Barr, Blachowicz, Katz and Kaufman (2002) (they indicated a reading rate between 30–70 words per minute), but less than Hasbrouck & Tindal (2006) (they indicated 53 words per minute being an average value for reading fluency skills at the end of the first grade) and less than Shanahan (2006) who indicated a mean value of the reading rate of 60 words per minute at the end of the first grade.

The milestones charts offered based on these findings in Table 5 is a valuable tool for establishing a proper difference between children with low reading abilities and children at risk for learning disabilities. This chart is even a more valuable tool for special education teachers, primary teachers and speech and language therapists as this is the first standardised output regarding this aspect for the Romanian language.

Grounding on these findings, we wanted to investigate if the linguistic syllabic composition can influence the reading fluency rates in the Romanian language. Correlations and comparisons among the reading fluency rates for monosyllabic, disyllabic, three syllable and text words were all highly significant at a $p \leq .01$ level, underlining the fact that the nature

of the linguistic material imposes different reading fluency skills. This aspect can explain the variance and discrepancies from the English and Romanian languages regarding reading fluency rates; this aspect gives value to the PEAFc probe, training and an assessment tool which compresses the specific phonological features of the Romanian language. That is the way the therapeutic strategies that can be introduced for improving students' reading fluency rates have to be based on the nature of the linguistic material (the syllabic composition of the linguistic material) (Wentink et al., 1997; Hautala et al., 2013a) transparent orthography, was assessed by lexical decision and naming tasks. Typical readers did not show reliable word length effects in lexical decision, suggesting establishment of parallel letter processing. However, there were small effects of word syllable structure in both tasks suggesting the presence of some sublexical processing also. Dysfluent readers showed large word length effects in both tasks indicating decoding at the letter-phoneme level. When lexical access was required in a lexical decision task, dyslexics additionally chunked the letters into syllables. Response duration measure revealed that dysfluent readers even sounded out the words in phoneme-by-phoneme fashion, depending on the task difficulty. This letter-by-letter decoding is enabled by the transparent orthography and promoted by Finnish reading education.”, “author” : [{ “dropping-particle” : “”, “family” : “Hautala”, “given” : “Jarkko”, “non-dropping-particle” : “”, “parse-names” : false, “suffix” : “” }, { “dropping-particle” : “”, “family” : “Aro”, “given” : “Mikko”, “non-dropping-particle” : “”, “parse-names” : false, “suffix” : “” }, { “dropping-particle” : “”, “family” : “Eklund”, “given” : “Kenneth”, “non-dropping-particle” : “”, “parse-names” : false, “suffix” : “” }, { “dropping-particle” : “”, “family” : “Lerikkanen”, “given” : “Marja-Kristiina”, “non-dropping-particle” : “”, “parse-names” : false, “suffix” : “” }, { “dropping-particle” : “”, “family” : “Lyytinen”, “given” : “Heikki”, “non-dropping-particle” : “”, “parse-names” : false, “suffix” : “” }], “container-title” : “Reading and Writing”, “genre” : “JOUR”, “id” : “ITEM-1”, “issue” : “6”, “issued” : { “date-parts” : [[“2013”]] }, “page” : “845-864”, “title” : “The role of letters and syllables in typical and dysfluent reading in a transparent orthography”, “type” : “article-journal”, “volume” : “26” }, “uris” : [“http://www.mendeley.com/documents/?uuid=981684e5-8785-4f19-b50e-96bd8e7d663c”] }, “mendeley” : { “formattedCitation” : “(Hautala et al. 2013; Klee et al. 2015).

The correlation between demographic aspects (such as gender, age and environment) and reading fluency rates was another aspect which was also investigated. The obtained results proved that environment was the only demographic aspect that influenced reading fluency rates. Students from urban areas proved to register higher reading fluency rates than children from rural areas. This aspect reflects a negative aspect of the Romanian educational system, this aspect is often interpreted as a result of the fact that teachers from rural areas either do not have the fully necessary competences and educational training to offer a proper teaching of the reading skills or their work is less sustained by specialised support teachers who intermediate and facilitate reading fluency acquisition. The rate of absenteeism and the school failure can be another aspect which may differentiate between students coming from rural or urban areas. According to some Romanian authors (Apostu et al., 2012), there are no significant differences at the primary school level between children studying in urban and children studying in rural areas regarding the rates of absenteeism and school failure. It seems that children from urban areas rate higher than children from rural areas. In this situation the last possible explanation for our research findings is related to the reduced number of children from rural ($N_r=385$) areas participating in this investigation, comparing with the higher number of children from urban areas ($N_u=1592$).

The last aspects investigated reading the relation between reading fluency rates and school performance emphasise reading fluency rates are highly reflected in the grades students obtained both in the Romanian language and Mathematic classes. This aspect strengthens the perspective offered by the European Dyslexia Association, (further EDA), which defines dyslexia as an umbrella concept for all learning disabilities “*a difference in acquiring reading, spelling and writing skills, that is neurological in origin. The cognitive difficulties that cause these differences can also affect organizational skills, calculation abilities, etc.*” (European Dyslexia Association-EDA 2014).

Conclusions

The present study is the first one that presents new norms for reading fluency and offers teachers and specialists in the speech and language field the first consistent milestones in reading fluency skills, ensuring the differentiation of the good readers and the poor readers and raising awareness regarding reading in specific learning difficulties domain.

This research is also valuable as it is based on the PEAF, an assessment and intervention tool completely adapted to the Romanian language speakers. The use of this assessment tool has a great importance as cultural comparisons can be entirely covered and justified.

Oral reading fluency skills in first graders proved to be an important aspect that must be considered when assessing their general school performance. For future research the aim is to continue with establishing oral reading norms for school age readers, including the fourth graders. At the national curricular assessment we consider that the norms for oral reading fluency should be taken into consideration, and their value should be increased by oral reading comprehension norms.

A main goal proposed by the European Commission for a “European Policy Network of National Literacy Organizations” (2013/C 130/07) was “*to identify good policy practices in raising literacy levels among children, young people and adults, particularly focusing on low achieving students and adults with in adequate levels of functional literacy*” (Garbee et al. 2015). The present study can be considered a good practice example in this field.

Further research studies in reading fluency for students at the end of each school year in primary school are recommended in order to establish norms for reading fluency at the end of each grade level and to identify the best intervention strategies for children at risk for dyslexia.

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References

- Abadiano, H. R., & Turner, J. (2005). Reading Fluency: The Road to Developing Efficient and Effective Readers. *The New England Reading Association Journal*, 41(1), 50–56.
- Adams, M. (1994). *Beginning to Read: Thinking and Learning about Print. Language & Cognitive Processes* (Vol. 22). doi:Article
- Adams, M. J. (1990). *Beginning to Read : Thinking and Learning about Print* (1st ed.). MIT Press.
- Apostu, O., Balica, M., Fartușnic, C., Florian, B., Horga, I., & Voinea, L. (2012). *Copiii care nu merg la școală. O analiză a participării la educație în învățământul primar și gimnazial*. București. Retrieved from: <http://www.unicef.ro/wp-content/uploads/copiii-care-nu-merg-la-scoala-pt-web.pdf>

- Ardoin, S. P., Eckert, T. L., & Cole, C. A. S. (2008). Promoting Generalization of Reading: A Comparison of Two Fluency-Based Interventions for Improving General Education Student's Oral Reading Rate. *Journal of Behavioral Education, 17*(3), 237–252. doi:10.1007/s10864-008-9066-1
- Baar, R., Bates, A., Blachowicz, C., Katz, C., & Kaufman, B. (2007). *Reading Diagnosis for Teachers : an Instructional Approach*. Pearson Allyn and Bacon.
- Barr, R., Sadow, M. W., & Blachowicz, C. L. Z. (1995). *Reading Diagnosis for Teachers : an Instructional Approach*. Longman Publishers USA.
- Biancarosa, G., & Cummings, K. D. (2015). New Metrics, Measures, and Uses for Fluency Data: an Introduction to a Special Issue on the Assessment of Reading Fluency. *Reading and Writing, 28*(1), 1–7. doi:10.1007/s11145-014-9516-1.
- Binder, C., Barrett, B., Birnbrauer, J., Haughton, E., Johnson, K., Kunzelmann, H., et al. (1996). Behavioral Fluency: Evolution of a New Paradigm. *The Behavior Analyst, 19*(2), 163–197.
- Bodea Hațegan, C., & Talaș, D. (eds.) (2015). *Fluența verbală. Direcții teoretice și aplicații psihopedagogice/ Verbal Fluency. Theoretical Directions and Practical Approaches*. (C). Cluj-Napoca/Gatinau: Symphologic Publishing/Argonaut. Retrieved from: https://asttlr.files.wordpress.com/2016/06/prezentare_site.pdf
- Bodea-Hățegan, C., & Talaș, D. (Eds.) (2014). *Fluența verbală. Direcții teoretice și aplicații psihopedagogice*. (1st ed.). Cluj-Napoca: Presa Universitară Clujeană Publishing House.
- Deeney, T. A. (2010). One-Minute Fluency Measures: Mixed Messages in Assessment and Instruction. *The Reading Teacher, 63*(6), 440–450. doi:10.2307/25615834.
- Dowhower, S. (1997). The Method of Repeated Readings (Reprinted from *The Reading Teacher*, vol 32, 1979). *Reading Teacher, 50*(5), 376–381. Retrieved from: <Go to ISI>://A1997WF77100003
- European Dyslexia Association-EDA. (2014). European Dyslexia Association - What Is Dyslexia? Retrieved from: <http://eda-info.eu/what-is-dyslexia>
- Fuchs, L. S., Fuchs, D., Hosp, M. K., & Jenkins, J. R. (2001). Oral Reading Fluency as an Indicator of Reading Competence: A Theoretical, Empirical, and Historical Analysis. *Scientific Studies of Reading, 5*(3), 239–256. doi:10.1207/S1532799XSSR0503_3
- Gagliano, A., Ciuffo, M., Ingrassia, M., Ghidoni, E., Angelini, D., Benedetto, L., et al. (2015). Silent Reading Fluency: Implications for the Assessment of Adults with Developmental Dyslexia. *Journal of Clinical and Experimental Neuropsychology, 37*(9), 972–980. doi:10.1080/13803395.2015.1072498
- Garbee, C., Valtin, R., & Mallows, D. (2015). *European Framework of Good Practices in Raising Literacy Levels of Children, Adolescents and Adults*. Cologne. Retrieved from: http://www.elinet.eu/fileadmin/ELINET/Redaktion/user_upload/Framework_of_GP_Website_JUNE_08062015.pdf.
- Griffith, L. W., & Rasinski, T. V. (2004). A Focus on Fluency: How One Teacher Incorporated Fluency with Her Reading Curriculum. *The Reading Teacher, 58*(2), 126–137. doi:10.1598/RT.58.2.1
- Harris, T. L., Hodges, R. E., & International Reading Association. (1995). *The Literacy Dictionary: The Vocabulary of Reading and Writing*. (International Reading Association, Ed.). Newark, Del: International Reading Association.
- Hasbrouck, J., & Tindal, G. A. (2006). Oral Reading Fluency Norms: A Valuable Assessment Tool for Reading Teachers. *The Reading Teacher, 59*(7), 636–644. doi:10.1598/RT.59.7.3
- Hautala, J., Aro, M., Eklund, K., Lerkkanen, M.-K., & Lyytinen, H. (2013). The Role of Letters and Syllables in Typical and Dysfluent Reading in a Transparent Orthography. *Reading and Writing, 26*(6), 845–864. JOUR. doi:10.1007/s11145-012-9394-3
- Keehn, S. (2003). The Effect of Instruction and Practice through Readers Theatre on Young Readers' Oral Reading Fluency. *Reading Research and Instruction, 42*(4), 40–61. doi:10.1080/19388070309558395
- Klee, I. C., Brasch, S. M., Neyman, J., McLaughlin, T. F., & Stookey, S. (2015). The Effect Using the REWARDS® Reading Program on Vowel Sounds, Word Part, and Prefix and Suffix Identification in Multi-Syllabic Words: A Case Report. *Educational Research Quarterly, 38*(4), 31–50. Retrieved from: <http://login.ezproxy.lib.umn.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,uid&db=eric&AN=EJ1061951&site=ehost-live;\nhttp://erquarterly.org/index.php?pg=content>
- Kubina, Jr., R. M. (2005). Developing Reading Fluency through a Systematic Practice Procedure. *Reading and Writing Quarterly, 21*(2), 185–192.

- Kuhn, M. R., & Stahl, S. A. (2003). Fluency: A Review of Developmental and Remedial Practices. *Journal of Educational Psychology, 95*(1), 3–21. doi:10.1037/0022-0663.95.1.3
- LaBerge, D., & Samuels, S. (1974). Toward a Theory of Automatic Information Process in Reading / Reading Rockets. *Cognitive Psychology, 6*, 293–323. Retrieved from: <http://www.readingrockets.org/articles/researchbytopic/4902>
- Lawton, T. (2008). Filtered Text and Direction Discrimination Training Improved Reading Fluency for Both Dyslexic and Normal Readers. *Optometry & Vision Development, 39*(3), 114–126.
- Leslie, L., Caldwell, J. (JoAnne S.), & Leslie, L. (2001). *Qualitative Reading Inventory, 3*. Longman.
- LeVasseur, V. M., MacAruso, P., & Shankweiler, D. (2008). Promoting Gains in Reading Fluency: A Comparison of Three Approaches. *Reading and Writing, 21*(3), 205–230. doi:10.1007/s11145-007-9070-1
- Lo, Y. Y., Cooke, N. L., & Starling, A. L. P. (2011). Using a Repeated Reading Program to Improve Generalization of Oral Reading Fluency. *Education and Treatment of Children, 34*(1), 115–140. doi:10.1207/s15548430jlr3701-2
- Morgan, P. L., & Sideridis, G. D. (2006). Contrasting the Effectiveness of Fluency Interventions for Students with or at Risk for Learning Disabilities: A Multilevel Random Coefficient Modeling Meta-Analysis. *Learning Disabilities Research & Practice, 21*(4), 191–210. doi:10.1111/j.1540-5826.2006.00218.x
- National Reading Panel. *Teaching Children to Read: An Evidence-Based Assessment of the Scientific Research Literature on Reading and Its Implications for Reading Instruction*. (2000). Retrieved from: <https://www.nichd.nih.gov/publications/pubs/nrp/documents/report.pdf>
- Recensământul populației și al locuințelor*. (2011). București. Retrieved from: <http://www.recensamantromania.ro/>
- Robson, C., Blampied, N., & Walker, L. (2015). Effects of Feedforward Video Self-Modelling on Reading Fluency and Comprehension. *Behaviour Change, 32*(1), 46–58. doi:10.1017/bec.2014.29
- Samuels, S. J. (1979). The Method of Repeated Readings. *The Reading Teacher, 32*, 403–408.
- Shanahan, T. (2006). Developing Fluency in the Context of Effective Literacy Instruction. In T. Rasinski, C. Blachowicz, & K. Lems (Eds.), *Fluency Instruction: Research-Based Best Practices* (pp. 21–38). New York: The Guilford Press. Retrieved from: http://writing1stiba.weebly.com/uploads/1/7/8/9/17893965/fluency_instruction_rasinski_blachowicz_lems.pdf
- Speece, D. L., & Case, L. P. (2001). Classification in Context: An Alternative Approach to Identifying Early Reading Disability. *Journal of Educational Psychology, 93*(4), 735–749. doi:10.1037/0022-0663.93.4.735.
- Torgesen, J. K., Wagner, R. K., & Rashotte, C. A. (1999). TOWRE: Test of World Reading Efficiency. Austin, Texa, USA.
- Torgeson, J., Wagner, R., & Rashotte, C. (2009). TOWRE-2 - Test of Word Reading Efficiency 2. Retrieved from: <https://www.mhs.com/product.aspx?gr=edu&prod=towre2&id=overview>
- Wentink, H. W. M. J., Van Bon, W. I. M. H. J., & Schreuder, R. (1997). Training of Poor Readers' Phonological Decoding Skills: Evidence for Syllable-Bound Processing. *Reading and Writing, 9*(3), 163–192. JOUR. doi:10.1023/A:1007921805360.
- White, S. (1995). *NAEPFact: Listening to Children Read Aloud: Oral Fluency (August 1995)*. Retrieved from: <http://nces.ed.gov/pubs95/web/95762.asp>

READING FLUENCY: NORMATIVE DATA FOR THE ROMANIAN-SPEAKING POPULATION

Summary

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Reading is a very complex academic skill that the students achieve throughout the first grades; this skill influences the academic progress of the students over the years. But there are only few recent studies in the Romanian language regarding reading normative data in elementary grades for teachers to follow and try to adapt different reading materials for elementary grades.

This research is based on the following main **objectives**, in order to establish norms regarding reading fluency for Romanian speakers: to compute normative values for reading fluency in first graders with typical development; to compare the values obtained, based on linguistic criteria, namely to establish if reading fluency of words is dependent either on the syllabic composition or the fact that the words are presented isolated or as parts of a text; to set up some diagnostic values for reading fluency abilities for Romanian students at the end of the first grade; to determine if there are any gender and age differences regarding reading abilities in first graders; to investigate the association between the performance in two different subjects (Romanian Language and Mathematics) and first graders' reading fluency abilities; to identify the differences between children in the first grade, based on the environment/ setting they are coming from (rural or urban).

The data was collected in compliance with a specified procedure. Researchers paid attention to the selection of the material used for assessment, the training of the people involved in data collection and the manner the obtained data was collected and registered.

The selection criteria for the participants were: to have a typical development (children with disabilities were not included in the research study); to be enrolled in the first grade.

The initial number of participants in the research was 1977, coming from 11 counties around the country: Bistrița-Năsăud (BN); Sibiu (SB); MS (Mureș); Caraș-Severin (CS), Timișoara (TM); Sălaj (SJ); Cluj (CJ); Suceava (SV); Vâlcea (VL); Dolj (DJ); Maramureș (MM). Thus, the data was collected at the national level. This aspect is relevant for our research as the norms we intend to offer at the end should to be representative for the whole Romanian population.

The materials used during the assessment sessions were selected from the PFEAC, Proba de evaluare și antrenare a fluenței în citire/ The Assessment and Training of Reading Fluency Instrument (Bodea-Hățegan and Talaș, 2014; Bodea Hățegan and Talaș, 2015). The materials used consisted of: one list of monosyllabic words, one list of disyllabic words, one list of three-syllable words and one list with a text. The linguistic material collected in the PEAFC was selected following carefully the linguistic features of the Romanian language. Thus, the linguistic material can be considered as representative/ typical for the Romanian language. The selection of the four specific lists used in the assessment of each participant was performed randomly from the whole PEAFC. Speech and language therapists were involved directly in collecting data for the current research. They participated in training sessions regarding the the PEAFC using procedure. One specific training session regarded the discussion of the summary report the professionals had to fill in after collecting the data.

The present study is the first one that presents new norms for reading fluency and offers teachers and specialists in the speech and language field the first consistent milestones in reading fluency skills, ensuring the differentiation of the good readers and the poor readers and raising awareness regarding

reading in specific learning difficulties domain. This research is also valuable as it is based on the PEAFC, an assessment and intervention tool completely adapted to the Romanian language speakers. The use of this assessment tool has a great importance as cultural comparisons can be entirely covered and justified.

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Further research studies in reading fluency for students at the end of each school year in primary school are recommended in order to establish norms for reading fluency at the end of each grade level and to identify the best intervention strategies for children at risk for dyslexia.

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