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Reading Strategies of Romanian Readers with Dyslexia in Upper Primary Grades

Strategie czytania rumuńskich czytelników z dysleksją w klasach podstawowych

SUMMARY

The current study addresses the nature of developmental reading deficits in Romanian upper primary grade students. We investigated the presence of a primary deficit in reading speed and the nature of reading strategies employed by Romanian dysfluent readers. This study is a part of a work in progress. Students with dyslexia were compared to students without dyslexia on measures of accuracy and speed of reading a text and non-word stimuli. The lexical procedure was investigated based on intra-individual comparisons of non-word vs. word reading, and high frequency vs. low frequency words. Our investigation yield interesting results. Students with dyslexia in third and fourth grades presented not only a reading speed deficit, but also less accurate reading. Also, there is evidence against the over-reliance of dyslexic children on the sublexical route.

Keywords: reading deficits; lexicality effect; frequency effect; reading speed; reading accuracy; transparent orthography

INTRODUCTION

In a synthesis report (EACEA/Eurydice 2011, p. 67, 70) on the situation of reading in European countries, Romania is offering little support to struggling readers. Moreover, it seems that teachers underestimate the need of support in the case of a reading difficulty, while struggling readers have less access to specialized personnel with

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competencies in remedial reading. Local research, however, needs to be conducted in order to better inform about the preparation of teachers, on the one hand, but also to add on the existing empirical data on reading development and reading difficulties.

There is much to learn on dyslexia and its specificity as related to the Romanian language. There are several linguistic factors that contribute to differences in reading development. One linguistic factor that could play an important role in differences as far as learning to read is concerned, and in the manifestation of reading difficulties is the syllabic complexity (Seymour, Aro, Erskine 2003, p. 145; Davies, Cueto, Glez-Seijaz 2007, p. 180). Syllabic complexity of a language predicts the easiness with which a beginner will gain access to the phonological structure of the language (Borleffs et al. 2017, p. 1619), as a basis for establishing the correspondence between a phoneme and grapheme. More open structures are more easily segmented into smaller units of which the learner becomes aware. The Romanian language is part of the Romance language family, being characterized by similar properties. Syllables in Romanian have a vocalic character. The Romanian language contains three times more open syllables than closed ones (Sclifos 2008) and the most frequent syllabic structures are consonant-vowel, consonant-vowel-consonant. Another dimension connected with reading difficulties is the transparency of orthography (a regular orthography) in the Romanian language. The Romanian written language is predominantly phonological, that is to say that there is no synonymy between letters (with very few exceptions). Its transparency was intentional through several writing system reforms that were applied in writing (Dragomirescu 2012). Research has shown, with a relative consistency, that in languages with such transparent orthographies, the development of reading skills goes faster (accuracy being obtained quite early in the schooling process). On the other hand, in regular orthographies it seems that reading deficits have a different presentation, being characterized rather by a slower speed, than by inaccurate reading (Wimmer 1993).

Similar evidence comes from the studies conducted in several transparent orthographic systems, e.g. Italian (Tressoldi, Stella, Faggella 2001, p. 416). This observation is explained partially by the fact that readers with dyslexia continue to use a sequential processing approach to the script.

There has been gathered evidence of the effect of language specificity on the strategies that students with dyslexia employ when having a reading task (Ziegler et al. 2003). It is more likely for a reader in a transparent orthography that he/she will use a sublexical reading strategy to access the content. Their success in reading also enhances the use of the respective strategy (Ellis et al. 2004). If reading occurs in a transparent orthography, then a sublexical reading strategy is more economical to adopt, as it applies to any kind of written material with consistency. However, if a student reads with difficulty, he/she may employ a strategy that is more adequate to his/her reading performance, such as recognition of written script by using more familiar parts of the words, that is a rather lexical reading strategy. At the same time,

recognition of written words as a whole occurs at the exposure of the reader to the written material. Dyslexic students face another difficulty here, as strong visual/orthographic representations of the written word are stored longer as the individual does his/her own processing when decoding the word via a sublexical procedure (see self-teaching hypothesis of Share 1995). Several studies indicate that dysfluent readers in transparent orthographies rely on analytical procedures when reading (De Luca et al. 2002; Ziegler et al. 2003; Zoccolotti et al. 2005; Suárez-Coalla, Cuetos 2012) and have difficulties learning the orthographic representations of words (Suárez-Coalla et al. 2014). Some studies indicate that over time, with gaining experience, persons with dyslexia build up an orthographic lexicon of high frequency words (see Moll, Hutzler, Wimmer 2005). Results are mixed as far as languages with a transparent orthography are concerned. Some studies indicate the presence of a frequency effect in reading of Italian children (Barca et al. 2006). Evidence of the use of a lexical strategy by students with dyslexia comes also from studies addressing the lexicality effect (Pagliuca et al. 2008). Lexicality effect is evident by the shorter reading latencies for word stimuli, as compared to reading latencies for non-word stimuli. In a study by Judica et al. (2002), dyslexics presented similar difficulties when reading either words or non-words.

Given the importance of gathering empirical data on similar depth orthographies and reading difficulties, our study aims at investigating the lexicality effect and word frequency effect in students with dyslexia and in average readers in order to bring more information on the specificity of developmental reading difficulties presentation in the Romanian written language. These effects are indicators of lexical access when reading. Given that the Romanian language uses a transparent orthographic script and the most common teaching method is an analytical one, we predict that reading difficulties of dyslexic students in Romania are characterized by slow reading speed, rather than by inaccurate reading. We hypothesized that Romanian readers with dyslexia from upper primary grades would employ a sublexical procedure in reading. We do not expect a lexicality effect.

METHODOLOGY

1. Participants. Selection scheme

Given the lack of valid instruments for the diagnosis of dyslexia in Romania, we employed a general selection procedure used in the literature. Students with reading difficulties and good readers were referred to by the classroom teacher and/or by the resource teacher. Students were further tested with a standardized reading test (Three Minute Reading Test) (Lemeni 2000). We tested 24 students from a regular school in Cluj-Napoca. Students with reading difficulties from third and fourth grades were included based on the criterion of having two consecutive years of low achievement

in reading. We only included the students that scored at least 7 on Block design and at least 6 on Similarities, low reading performance for two consecutive years (in the case of third and fourth graders, as supported by school records), and low performance on the Three Minute Reading Test. From the initial pool of slow readers, we eliminated 4 that did not meet the criteria for average cognitive performance. The final group of students with dyslexia was comprised of 9 participants. We considered two control groups: an average readers group and a reading ability-matched younger group (N = 5). These students were referred to by the teachers as being good readers and obtained scores over 7 on Block design and of at least 6 on the Similarities tests from the W.I.S.C.-IV battery. All participants had normal or normal to corrected vision. Students were tested with the written informed consent of the parents. Table 1 provides group volume by grade. Table 2 contains the characteristics of the sample.

Table 1. Group volume by grade

Grade	N (with dyslexia)	N (without dyslexia)
3rd	3	5
4th	6	6

Source: own work.

Table 2. Characteristics of the sample

Group	Chronological age	Male: female	Block design Standard score	Similarities Standard score
RD (N = 9)	131.11 (10.994)	7:2	8.88 (1.76)	9.11 (1.61)
AR (N = 11)	128.00 (8.97)	4:7	10.90 (2.16)	12.27 (1.61)
AM (N = 5)	111.20 (7.95)	4:1	10.80 (2.28)	13.60 (2.88)

RD – with dyslexia; AR – average readers; AM – reading ability-matched younger controls

Source: own work.

2. Instruments

For the selection of students with reading difficulties, we used Three Minutes Reading Test (Lemeni 2000). The test contains lists of isolated words grouped on three different levels of difficulty. The student has to read as fast and as accurate as possible as many words in the list for one minute. Based on the results, students were assigned to a group of slow readers (scores that fall with 40% under the mean) and a group of good readers (scores fall with the most 25% over the mean).

Reading speed and accuracy for text reading were measured with Prove MT (Cornoldi, Colpo 2012) (pilot study; N = 150). Students have the task to read a passage from a text within 4 minutes. Reading speed was expressed in syllables per second. Reading accuracy is given by the number of errors adjusted to the read volume.

In order to address lexicality effect and word frequency effect, we used DDE-2 (Sartori, Job, Tressoldi 2013). DDE-2 is a battery of tests that includes word and non-word reading lists. It allows to measure both reading accuracy and reading speed. Moreover, it has a selection of words based on the frequency criterion. For the adaptation process of DDE-2, we developed four lists of words, based on frequency and degree of concreteness. Since there were no frequency databases at the time, we employed a procedure that was used in the literature, by comparing the words to a corpus of words categorized by frequency, that are taken from movie subtitles. A panel of experts (primary teachers, special education teachers) were asked to categorize the words into frequent-concrete, frequent-abstract, low frequent-concrete, low-frequent abstract. We obtained, therefore, four lists of 28 words each. Lists are comprised of 70, 76, 72 and 80 syllables. Most of the words contained in the lists are disyllabic. We also developed 3 lists of 16 non-words, using a common procedure of altering existing words, by changing one or two letters, in such a manner that it does not affect pronunciation.

We used Block Design and Similarities, from the W.I.S.C- IV (Dobrean 2012) in order to measure the non-verbal and verbal cognitive development.

Reading achievement was measured based on school records.

3. Procedure

Students were tested in two sessions. One session addressed the reading and the other one – the cognitive measures. The students were tested individually outside the classroom, in an adequate, quiet room.

RESULTS

Students with dyslexia were compared with students with average performance on text reading. We measured reading speed and reading accuracy. We used the Mann–Whitney U test in order to test for the existence of differences. Comparisons yield significant differences between the two groups, not only in reading speed ($U = 7.5$; $p < .001$), but also in reading accuracy ($U = 0$; $p < 0.0001$). Descriptives are reported in Table 3.

Table 3. Descriptive statistics for reading accuracy (median of error counts) of a text, reading speed of a text and reading speed of non-words

Reading parameters	RD median (N = 9)	AR median (N = 11)	AMR median (N = 5)
Reading accuracy (median of error counts) of a text	11.50	2.75	4.00
Reading speed of a text (syllables/seconds)	1.50	3.16	3.93

Reading parameters	RD median (N = 9)	AR median (N = 11)	AMR median (N = 5)
Reading speed of non-words	0.49	0.72	0.46
Reading accuracy of non-words (error percentage)	0.29	0.10	0.08

RD – with dyslexia; AR – average readers; AMR – ability-matched younger average readers (second graders)

Source: own work.

As for non-word reading, students with dyslexia differed from students without dyslexia with regard to reading speed ($U = 13$; $p < .006$). As far as non-word reading accuracy is concerned, the students with dyslexia made significantly more errors than students without dyslexia ($U = 3$; $p < 0.05$). It takes longer and it is more laborious for a student with dyslexia to read non-words, as compared to average readers, indicating that the phonological assembly route is impaired in the case of dyslexic students.

A supplementary, yet necessary, comparison was introduced in order to address the non-word deficit. Students with dyslexia were compared with younger students (second graders) ($N = 5$) without dyslexia, matched on reading rate of words ($U = 15$; $p > .05$). The students with dyslexia did not differ from those without reading difficulties with regard to the speed of non-word reading ($U = 22.5$; $p > .05$), but they differed in terms of accuracy ($U = 1.5$; $p < 0.05$). We compared the dyslexic group with the non-dyslexic one with regard to reading ability matched on error rate of non-words. Higher error rates were observed in the dyslexic group ($U = 1.5$; $p < .002$).

Our second hypothesis dealt with the type of reading strategy employed by students with dyslexia. Given the transparency of orthography, as well as the main teaching method (phonological analytical-synthetic method), we predicted that students with dyslexia in upper primary continue to use analytical strategies in reading, that explain the slower reading speed as compared to average readers. Given the laborious reading process, as well as its inconsistency, we predicted that upper primary grade students with dyslexia do not use a lexical strategy in reading, as they did not accumulate enough reading experience, automaticity, as well as clear orthographic representations in order to access words from script. In order to investigate the use of lexical access in reading, we tested the students for the presence of lexicality effect and frequency effect. Lexicality effect was investigated by intragroup comparisons on word and non-word reading rates.

Students with dyslexia presented slower reading speed when juxtaposed with non-word stimuli, as compared to word reading ($z = -2.66$; $p < 0.008$). They read slower non-word stimuli as compared to word stimuli.

The lexicality effect, as expected, was present in the average readers and it was more pronounced ($z = -2.93$; $p < 0.003$).

The frequency effect was investigated by intra-group comparisons on reading of isolated words selected by frequency and concreteness. Students with dyslexia did not present a significant frequency effect ($z = -.77$; $p > 0.05$, based on positive ranks) on

reading speed of isolated words, independent of the degree of concreteness ($z = -.652$; $p > .05$). However, differences emerged in the case of reading accuracy of frequent concrete words. Frequent concrete words were read more correctly than infrequent ones ($z = -2.68$; $p < .007$).

On the other hand, students that were average readers read faster words that were more frequent, regardless of the concreteness value ($z = -2.49$; $p < 0.013$, based on positive ranks, for concrete words; $z = -1.957$; $p < .05$, based on positive ranks, for abstract content words). Differences in reading accuracy of frequent concrete words also emerged. Frequent words were read more accurately than infrequent words ($z = -2.25$; $p < 0.05$).

DISCUSSION AND CONCLUSIONS

Given that the Romanian written language uses a fairly transparent orthography, we hypothesized that the development of reading skills, even in the case of dyslexic children, will be carried out more smoothly, as in gaining the accuracy, but at the cost of the speed and effort of reading. In other words, we expected to find differences in reading speed, but not in reading accuracy in upper primary school students with dyslexia. According to our prediction, students with dyslexia read at a slower pace, than students without dyslexia. However, reading accuracy between groups was not comparable. Dyslexic children in third and fourth grades made more errors in reading. This finding brings support for using reading accuracy as an indicator of dyslexia. Consistent with Wimmer (1993) and Zoccolotti et al. (2005), we found that students with dyslexia displayed slower reading speed as compared to students without dyslexia. This result supports the idea that dyslexia is evidenced through lower reading speed.

The non-word reading deficit was evidenced in our sample. Reading non-words less accurately than controls indicates the presence of deficits in the phonological route which is more extensively used in the learning phase. Students with dyslexia read non-words as average younger readers, but with less accuracy.

We did not find consistent lexical access strategy use in our sample of dyslexia students. Lexicality effect, at least in our small sample, was evidenced through the facilitation present in word reading as compared to non-word reading. This result brings evidence for the use of the orthographic route in order to perform reading tasks by students with dyslexia, already in upper primary grades. These results are in line with Paizi et al. (2013, p. 323) and add on to the idea that there is already a functional lexical processing in place for reading in a transparent orthography like Romanian. The results bring evidence against a lexical reading deficit in a regular orthography. However, the frequency effect in the dyslexia group did not yield conclusive results. Word frequencies affected reading accuracy, but not speed. Further investigations on word frequency effect should be conducted on a larger sample.

On the other hand, lexical and word frequency effects were evidenced in the case of non-dyslexic students. Third and fourth graders already employ lexical reading strategies that make the reading more fluent.

To conclude, dyslexia in the Romanian language comprises not only a reading speed deficit (consistent for any type of reading material, whether text, isolated words or non-words), but also less accurate reading, at least in upper primary grades. These results sustain the idea of using both indicators of reading degree of automation when assessing dyslexia.

Given the difficulty of using the phonological route, the inconsistency of reading output, the insufficient reading experience, it seems that orthographic representations are not functional enough to be retrieved consistently in reading. Nonetheless, we cannot exclude the hypothesis that students with dyslexia may employ not only laborious assembly strategies, but also lexical access strategies that are more economical. Overall, these results add on to the knowledge on the nature of dyslexia deficits in a transparent orthographic system, but also on evidence regarding reading development theories.

The current research brings evidence that students with reading difficulties employ both strategies in reading, not only phonological, but also visual-orthographic. Also, we obtained that students with reading difficulties, even in a transparent orthography, continue to present lower accuracy in reading, in upper primary grades, as compared to the average readers. These results inform on educational approaches of students with reading difficulties. When working with students with reading difficulties, teachers not only need to provide extra time for tasks that require reading, but also to make sure of the accuracy of reading comprehension, as well as of consistency in the sound-letter complex, in order to build strong, clear orthographic representations of words. Also, based on the data, we do not recommend bypass strategies that dispense students with reading difficulties from reading, especially in primary grades, because they need to develop visual representation of words and use them. Students need opportunities to develop reading practices, they need exposure to reading. Teachers should give particular attention to the accuracy of reading and offer feedback on reading in order to contribute to the development of a visual orthographic lexicon. Also, more focus should be given to vocabulary knowledge building, especially in case of students with reading difficulties. We know that reading contributes in turn to incidental learning of vocabulary. It is a circular effect that we can acknowledge and use in remedial teaching.

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STRESZCZENIE

Badania opisane w opracowaniu dotyczą deficytów w rozwijaniu czytania w przypadku rumuńskich uczniów klas podstawowych. Zbadano występowanie deficytu pierwotnego w zakresie szybkości czytania oraz charakter strategii czytania wykorzystywanych przez rumuńskich czytelników. Przedstawiona analiza dotyczy fragmentu większych badań. Uczniowie z dysleksją zostali porównani do uczniów bez dysleksji, biorąc pod uwagę dokładność i szybkość czytania. Procedurę leksykalną badano na podstawie wewnątrzindywidualnych porównań odczytu bez słowa i słowa oraz słów o wysokiej częstotliwości i niskiej częstotliwości. Uzyskano interesujące wyniki. Uczniowie z dysleksją w trzeciej i czwartej klasie prezentowali nie tylko deficyt prędkości czytania, ale także mniej dokładną lekturę.

Słowa kluczowe: deficyty w czytaniu; efekt leksykalności; efekt częstotliwości; prędkość odczytu; dokładność czytania; ortografia transparentna