



# Lexical stress assignment and reading skills of Russian heritage children

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## Abstract

The present study is focused on language proficiency and reading skills of Russian–Cypriot Greek bilingual children, Russian heritage speakers, children of the first generation immigrants living in Cyprus. Their dominant society language is Cypriot Greek, while their home (weak/minority) language is Russian. They have limited exposure to Russian, only at home, and low level of schooling in Russian, only 1-2 hours of Russian lessons per week (Saturday schools). Longitudinal methodology was implemented to investigate developmental trajectory, dominant language transfer, divergent attainment and attrition of L1 by Russian heritage speakers in Cyprus (Polinsky and Kagan 2007; Montrul 2008, Benmamoun et al. 2013). Heritage speakers were measured on their reading skills in Russian every month for a period of one year. Longitudinal data consists of the oral corpus of reading aloud recordings. It was found that heritage children had both developmental and transfer (from CG) lexical stress errors in their reading. There was found a correlation between speech rate, word-per-minute output in reading and spontaneous/elicited speech, and degree of grammatical knowledge, this is in line with Polinsky (2008, 2011).

### 1.1. Introduction

Heritage speakers are bilinguals in home and dominant languages, they have more family or cultural motivation and connection to the former, minority or immigrant language, and are more proficient in the latter, society language (Polinsky and Kagan 2007; Benmamoun et al., 2013; Polinsky 2015).

The present study is focused on reading skills of Russian–Cypriot Greek bilingual children, Russian heritage speakers, children of the first generation immigrants living in Cyprus. Their dominant society language is Cypriot Greek, while their home (weak/minority) language is Russian. They have limited exposure to Russian, only at home, and low level of schooling in Russian, only 1-2 hours of Russian lessons per week (Saturday schools).

The linguistic situation in Cyprus can be described as diglossic, bi-dialectal (Grohmann and Leivada 2011) or bilectal (Rowe and Grohmann 2013); two varieties are used by the Greek Cypriot population, Standard Modern Greek (SMG) and Cypriot Greek (CG). Besides, Cyprus can be considered a multilingual country as there are Cypriot minorities (e.g., Latin, Maronites) who live in Cyprus, residents of British origin, immigrants from various countries of Eastern Europe, Asia, and especially the former Soviet Union.

The Russian community in Cyprus represents the largest foreign language group. There are temporary residents, tourists or business people who use mainly Russian at home and Russian or English or some other European language on a daily basis — but not Greek. The other group is formed by members

of mixed marriage families, mainly with a Russian woman and a Greek Cypriot man and bilingual Russian–Cypriot Greek children. Besides, there are members of immigrant families, where mostly both partners are Russian, who aim for long-term residence in Cyprus, so they speak Russian at home and English or Greek outside (Karpava 2015).

### 1.2. Reading acquisition: stress in Greek and in Russian

In Greek, stress is lexical, unpredictable by phonological criteria such as syllable weight or vowel quality and dependent on lexical specification instead (Malikouti-Drachman and Drachman 1989; Revithiadou 1999; Apoussidou 2003; Revithiadou 2007; van Oostendorp 2012). It is restricted by a three-syllable window. Stress can fall on any of the last three syllables (final, penultimate and antepenultimate syllable), but not on any other syllable of the word.

Stress in Russian is strongly central. Stressed syllables are pronounced with more prominence in comparison to other syllables. Syllables can have various degrees of vowel intensity and length depending on the stressed syllable. Numerous irregularities are because Russian orthography does not represent vowel reduction in unstressed position (Bondarko 1998). In Russian orthography, stress is marked only in dictionaries and books for beginners. Skilled readers have to assign stress based on their linguistic competence. The phonemic structure of a Russian word depends on stress assignment. Errors in stress assignment can change word meaning and can lead to problems in comprehension. Stress in Russian is free, it can fall on any syllable in a word; also, it is mobile (i.e. it can move to another syllable). Stress mobility has morphological motivation; shifted in word formation and inflection.

Writing in Russian dissociates from pronunciation, but only at certain points such as morphemic boundaries, absolute end of the word for consonants and inside the morphemes for vowels (Ivanova 1966; Liberman 1989). Stress assignment in Russian is unpredictable and the readers need to have a well-developed visual anticipation ability but beginner readers have problems with it as they focus mainly on the sequential phonological reading (Rayner 1986).

There are certain difficulties in the development of phonological awareness (Lepskaya 1987; Bogomazov 2001) due to irregularities of grapheme-phoneme correspondence in Russian. Russian orthography does not reflect all language-specific features of Russian morphology and phonology. Reading instruction should be focused on the developing anticipatory orientation to the vowel (Ivanova 1966), blending inside a syllable (Elkonin 1988) as well as on the mechanism of decoding a CV syllable (Kornev 1997). According to Kerek and Niemi (2009), reading instruction in Russian school is mainly focused on the speed of reading aloud, the students need to pay attention to the basic phoneme-grapheme correspondences and

blending sounds inside CV syllables (Starzhinskaya 1988; Omorokova 1997; Kostromina and Nagayeva 1999).

### 1.3. Study

This study measured language proficiency of bilingual children in their both languages, Russian and CG, and the development of their reading skills in Russian. The following research questions were under investigation:

RQ1: Are Russian–CG children balanced bilinguals?

RQ2: Is there a difference between their perceptive and productive skills in both languages, Russian and CG?

RQ3: Which factors do affect the development of their reading skills? Do bilingual Russian–CG children have any difficulties with lexical stress assignment?

The participants were 39 simultaneous bilingual children (Russian–Cypriot Greek), 17 boys and 22 girls, born in Cyprus (father CG and mother Russian). They were recruited from public Saturday Russian school in Larnaca, Cyprus (school year: 2015-2016). See the distribution in Table 1.

Table 1. *Bilingual children: age, gender and school grade.*

| N  | School grade    | Female | Male | Mean age | Range     | SD  |
|----|-----------------|--------|------|----------|-----------|-----|
| 11 | 2 <sup>nd</sup> | 5      | 6    | 8;8      | 7;7-9;8   | 0.7 |
| 9  | 3 <sup>rd</sup> | 5      | 4    | 9;9      | 8;11-12;5 | 1.4 |
| 8  | 4 <sup>th</sup> | 4      | 4    | 10;8     | 9;4-12;0  | 0.8 |
| 11 | 5 <sup>th</sup> | 8      | 3    | 12;12    | 9;5-14;1  | 1.3 |

The participants were tested on a large battery of tests. Their language proficiency in Greek/CG and Russian were measured with the Developmental Verbal IQ Test (DVIQ), slightly adapted to CG from Stavrakaki and Tsimpli's (2000) SMG original and the Russian Proficiency Test for Multilingual Children (RPTMC) (Gagarina et al. 2010) respectively.

The Russian language proficiency test for multilingual children (Gagarina et al. 2010) examines the following language domains: productive and receptive lexicon for verbs and nouns, production of morphological marking on verbs (first and second-person singular present verbal inflection) and nouns (accusative and dative case singular), comprehension of grammatical constructions on the sentence level.

The Developmental Verbal IQ Test (DVIQ), slightly adapted to CG from SMG (Stavrakaki and Tsimpli 2000) investigated the following aspects of linguistic development: lexicon production and comprehension, morphology and syntax production, comprehension of metalinguistic concepts, comprehension of morphology and sentence repetition.

Besides the test, a detailed questionnaire (filled by parents) on language input situation, linguistic and extra-linguistic development of a child was used (Gagarina et al. 2010). Elicited and spontaneous oral production, in Russian and CG, obtained via elicited story-telling while describing eight sets of pictures (Tsimpli et al. 2005) was analysed in terms of speech rate (number of words per minute). Both bilingual children and their parents were tested.

The study was focused on the analysis of reading skills development of bilingual children, in particular reading speed, words per minute (WPM): a measure of words processed in a

minute, as well as lexical stress. Bilingual Russian–CG children were asked to read the texts, their oral reading data was recorded, transcribed and analysed. The bilingual children were tested in the second semester of the 2015-2016 school year. All the children were attending Saturday classes of the Russian language, all the testing happened during the class as part of their classroom activities. Overall, there were 8 testing sessions.

## 2. Results and discussion

The results of the RPTMC showed that bilingual children had a better performance in perception skills (lexicon and grammatical constructions) in comparison to production skills (lexicon and grammatical constructions). With regard to lexicon production, it was found that bilingual children showed better productions for nouns (64.38%) than for verbs (54.68%), as can be seen in Table 2:

Table 2. *Russian Language Proficiency Test Results.*

| RPTMC: measures                       | Target production % | Mean  | SD   |
|---------------------------------------|---------------------|-------|------|
| Production Lexicon: nouns             | 64.38%              | 16.73 | 5.53 |
| Production Lexicon: verbs             | 54.68%              | 14.21 | 5.02 |
| Production: case                      | 55.79%              | 3.34  | 2.20 |
| Perception: grammatical constructions | 71.54%              | 15.73 | 2.91 |
| Production: verbal inflection         | 81.88%              | 9.82  | 2.16 |
| Perception lexicon: nouns             | 80.43%              | 8.04  | 1.55 |
| Perception lexicon: verbs             | 76.95%              | 7.69  | 1.63 |

Regarding DVIQ scores, it was found that bilingual children scored higher on receptive skills rather than on productive skills. Paired samples t-test showed that there is a statistically significant difference between morpho-syntax production and perception ( $p=.000$ ). The analysis of lexicon production (nouns and verbs) for Greek DVIQ by bilingual children showed that their overall production for nouns was slightly better than for verbs, as illustrated in Table 3.

In both Russian and CG, bilingual children scored higher on receptive skills rather than on productive skills. It is possible that certain morpho-syntactic structures are yet to come on-line (Kohnert et al. 2009) for production despite excellent receptive morpho-syntactic skills. They had slightly better overall scores for DVIQ (70%) than for RPTMC (68%), thus, based on their language proficiency level; it seems that the participants are balanced bilinguals.

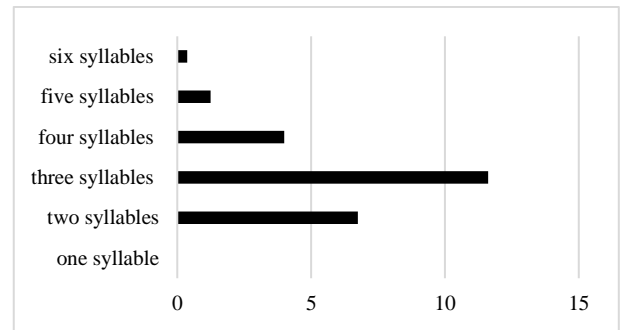
The results of the speech rate analysis (number of words per minute), based on oral production revealed that bilingual Russian–CG children had a higher speech rate in CG (Mean 53.39, range 19-84, SD 15.93) in comparison to Russian (Mean 38.3, range 25-65, SD 15.12).

Table 3. *DVIQ Results.*

| DVIQ Greek: measures    | Target production % | Mean   | SD    |
|-------------------------|---------------------|--------|-------|
| Total scores            | 73.17               | 110.89 | 23.81 |
| Lexicon production      | 62.09               | 16.91  | 4.38  |
| Morphosyntax production | 59.55               | 13.95  | 5.26  |

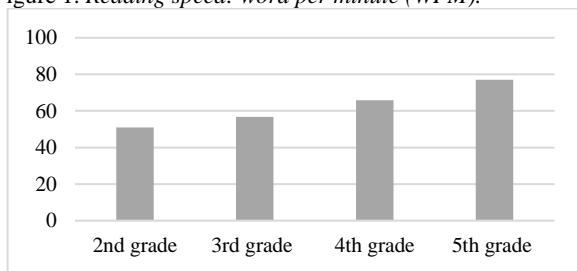
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| Morphosyntax comprehension               | 78.17 | 26.26 | 7.44 | The data analysis showed that most of the errors produced by bilingual children while reading in Russian are in 3- and 2-syllable words, mostly nouns, as Figure 4 illustrates. |
| Comprehension of metalinguistic concepts | 74.11 | 19.30 | 4.49 |   |
| Sentence repetition                      | 82.72 | 43.70 | 5.64 |   |

Figure 4. Stress errors, number of syllables.



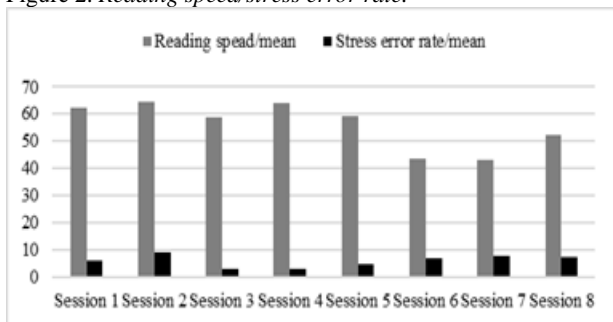
The analysis of the data showed that there is an overall increase in their reading speed (mean scores). Figure 1 shows that bilingual children produce more words per minute in Russian when they are in a higher grade: 2nd grade (Mean 50.9, range 22-85, SD 19.21); 3rd grade (Mean 56.8, range 41-70, SD 9.65); 4th grade (Mean 65.87, range 46-106, SD 19.34); 5th grade (Mean 77.12, range 36-128, SD 41.41). Overall, their reading speed is lower than L1 Russian monolingual norms.

Figure 1. Reading speed: word per minute (WPM).



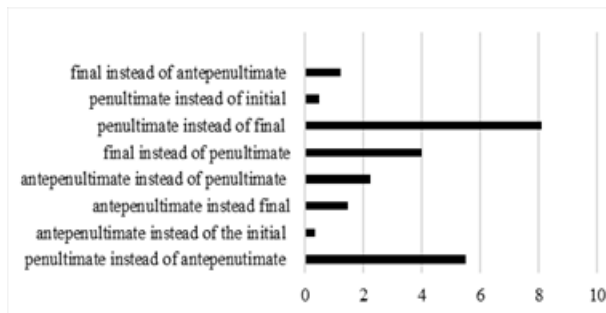
There seems to be a correlation regarding reading speed and stress errors: the lower is the stress error rate the higher is the reading speed per each testing session, as can be seen in Figure 2.

Figure 2. Reading speed/stress error rate.



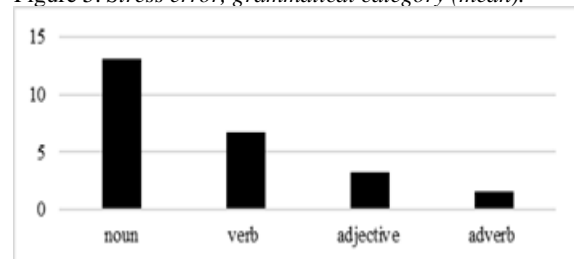
The most frequent stress errors (word level), while reading, were penultimate instead of final, penultimate instead of antepenultimate and final instead of penultimate (see Figure 3).

Figure 3. Stress errors (word level).



These nouns are mainly non-frequent words. Bilingual children might not fully understand the meaning of these words due to limited input to the Russian language and culture (Figure 5).

Figure 5. Stress error, grammatical category (mean).



Stress errors of bilingual Russian-CG children are only within final-penultimate-antepenultimate syllables range, see examples (1)-(10). This could be due to L1 transfer from CG. Future research (elicitation tasks with 4, 5, 6-syllable words) is necessary.

- (1) *ножи* 'knives' (penultimate) instead of *ножи* (final)
- (2) *озеро* 'lake' (final) instead of *озеро* (antepenultimate)
- (3) *высоко* 'high' (antepenultimate) instead of *высок* (final)
- (4) *глядит* 'looks' (penultimate) instead of *глядит* (final)
- (5) *пески* 'sands' (penultimate) instead of *песк* (final)
- (6) *поломанный* 'broken' (penultimate) instead of *поломанный* (final)
- (7) *колодец* 'well' (final) instead of *колодец* (penultimate)
- (8) *ловила* 'she was catching' (antepenultimate) instead of *ловила* (penultimate)
- (9) *моросил* 'it drizzled' (penultimate) instead of *моросил* (final)

(10) *костры* ‘bonfires’ (penultimate) instead of *костры*  
(final)

The analysis of elicited and spontaneous oral production, in Russian, obtained via elicited story-telling while describing eight sets of pictures (Tsimpli et al. 2005) was analysed in terms of lexical stress assignment (target vs non-target) as well. The results were in line with oral reading data. Similar types of stress errors were revealed.

According to Pearson correlation (Sig. 2-tailed), reading speed in Russian (bilingual children) is correlated with school grade (.005), age (.003). School grade is correlated with reading speed in Russian (.005), age (.000), overall error/word ratio (.000). Age is correlated with reading speed in Russian (.003), school grade (.000), overall error/word ratio (.002).

Overall, there is a developmental pattern with respect to reading speed (WPM), improvement of reading skills from the 2<sup>nd</sup> to the 5<sup>th</sup> grade with increase of schooling exposure/input. Age, schooling, gender affect the development of reading skills of bilingual children.

### 3. Conclusions

It was found that reading skills of Russian–CG bilingual children develop with age and schooling. There is an increase of the reading speed (WPM) and decrease in lexical stress errors. Stress errors of bilingual children are both developmental and due to L1 transfer from CG into Russian. The most frequent stress errors (word level), while reading, were penultimate instead of final, penultimate instead of antepenultimate and final instead of penultimate. Stress in Greek and CG is lexical and it is marked in orthography, which is not the case in Russian, where stress assignment is quite unpredictable. As these children have a limited input to their heritage language, they might have difficulty to develop linguistic competence required for correct lexical stress assignment and they either transfer from CG or focus mainly on the sequential phonological reading due to the lack well-developed visual anticipation ability.

The results of the RPTMC and DVIQ showed that bilingual children in Cyprus have higher scores for perceptive skills than productive skills. They show a developmental pattern with age and school exposure for production and receptive skills, reading and writing skills. The gap between comprehension and production in bilingual children can be due to the bilingualism effect (Oller and Eilers 2002). It may be the evidence of passive bilingualism (De Houwer 2007) as bilingual children might have high level of comprehension in both languages, and high level of production only in the dominant one. Comprehension precedes production in lexical development (Clarks and Hecht 1983); bilingual children lag behind monolinguals with respect to productive skills, but perform better comparatively to monolinguals with respect to comprehension or receptive skills (Thordardottir 2011). The gap between production and comprehension can be eliminated with more exposure to both languages and more output in both languages (Thordardottir 2011); semantic development is influenced by input, while morpho-syntax is affected by both input and output (Bohman et al. 2010). More research is needed to inform the parents and the authorities about the importance of a balanced bilingual development of a child, without forgetting a heritage or a minority language.

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