Emergent literacy of 5-year-old Estonian- and Russian-speaking Estonian children: What subskills are behind the differences?

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Abstract. In 2018, the International Early Learning and Child Well-being Study (IELS) was conducted in Estonia, England, and the United States (OECD 2020a). The present study focuses on emergent literacy and examines the effects of language and gender on five-year-old Estonian children's test performance in different subskills of emergent literacy. The sample comprised of the test performance of 1611 Estonian-speaking and 444 Russian-speaking children who attended kindergartens in which Estonian and Russian were the language of instruction, respectively. Children's vocabulary, sentence and narrative comprehension, and phonological awareness were assessed. The results indicated the main effect of language on the majority of the subskills, reflecting better test performance among Russian-speaking children compared to their Estonian-speaking peers. In addition, girls performed significantly better than boys on most of the tasks.

Keywords: pre-literacy skills; vocabulary; linguistic comprehension; phonological awareness; Estonian; Russian

1. Introduction

In 2018, the International Early Learning and Child Well-being Study (IELS) was conducted in Estonia, England, and the United States, involving more than 7000 children, their parents, and teachers (OECD 2020a). Five-year-old children's achievement in emergent literacy and numeracy, self-regulation, and social and emotional skills was assessed. Approximately 2100 Estonian children participated in the study, including 80% and 20% children from kindergartens with Estonian and Russian as the languages of instruction, respectively. The present study focuses on emergent literacy, which is a prerequisite for later literacy development. The results of the IELS showed that emergent literacy performance was significantly higher in Russian-speaking children than their Estonian-speaking peers. In addition, Russian-speaking girls scored significantly higher than Russian-speaking boys, but results did not differ between Estonian-speaking girls and boys (OECD 2020a). However, as the analysis used a composite score of emergent literacy, it did not show which subskills differed between the language and gender groups.

In the present study, we used the IELS survey data from Estonian children. We aimed to analyse the subskills of emergent literacy in more detail, examining the effects of language and gender on children's test performance in vocabulary, sentence comprehension, narrative comprehension, and phonological awareness. This study is informative on two accounts. First, knowledge about the emergent literacy skills of children from Estonian- and Russian-language kindergartens enables us to improve efforts to teach these skills to children in kindergartens with different languages of instruction. Moreover, the results complement previous cross-linguistic research on examining pre-literacy skills of children from different cultural-linguistic contexts.

1.1. Emergent literacy skills

Literacy acquisition is one of the most important tasks in school. Proficiency in literacy is essential for being successful in school and society. In recent decades, a number of studies have been conducted to identify the roles of various linguistic skills in literacy development (see Hjetland et al. 2017). In the following literature review, we summarise the predictive roles of pre-literacy skills measured in the IELS study (OECD 2020a) – namely, vocabulary, sentence comprehension, narrative comprehension, and phonological awareness.

The relationship between vocabulary and literacy skills have been extensively studied in previous research. Evidence suggests the significant effect of receptive vocabulary on subsequent reading comprehension (de Jong & van der Leij 2002; Lervåg & Aukrust 2010; Manu et al. 2020; Tunmer & Chapman 2012; Verhoeven & van Leeuwe 2008; Verhoeven et al. 2019; see also Hjetland et al. 2017), reflecting the central role of vocabulary in reading comprehension processes. In addition, vocabulary has been found to predict word decoding skills, although less strongly than reading comprehension (de Jong & van der Leij 2002).

Syntactic skills have also been found to predict later reading skills. Sentence comprehension in preschool age predicts subsequent word recognition (Babayiğit et al. 2021), reading speed and fluency (Lepola et al. 2005) as well as reading comprehension (Babayiğit et al. 2021; Lepola et al. 2005; Silva & Cain 2015), with the latter relationship (i.e., between sentence comprehension and reading comprehension) found to be the strongest (Lepola et al. 2005; see also Hjetland et al. 2017). As recently shown, the effect of syntactic skills on reading comprehension is long-lasting: sentence comprehension in five-year-old children predicted significantly reading comprehension even nine years later when the children were 14 years old (Babayiğit et al. 2021).

Research has revealed that, in addition to word- and sentence-level skills, the ability to comprehend orally presented stories predicts subsequent reading fluency and even strongly predicts reading comprehension

(de Jong & van der Leij 2002; Lepola et al. 2005). Several studies have found that four- to six-year-old children's ability to comprehend oral narratives has an effect on reading comprehension performance in primary and middle school (Babayiğit et al. 2021; Kendeou, van den Broek et al. 2009; Manu et al. 2020). These findings indicate that the processes of listening and reading comprehension largely involve the same cognitive-linguistic skills, such as vocabulary and discourse-level skills (Kendeou, Savage et al. 2009).

Although the oral language skills predict foremost the development of reading comprehension, phonological awareness, defined as "the ability to detect, manipulate, or analyse the auditory aspects of spoken language (including the ability to distinguish or segment words, syllables, or phonemes), independent of meaning" (NELP 2008: vii), is a significant predictor of code-related skills of written language. An extensive body of studies carried out in several alphabetic languages has shown that phonological awareness in preschool is an important predictor of decoding and spelling (e.g., Aro & Wimmer 2003; Georgiou et al. 2008; Moll et al. 2014).

However, the strength of the relationship with subsequent literacy skills depends on the transparency of the orthography. Some orthographies are transparent (e.g., Finnish, Greek, and Italian), with consistent grapheme–phoneme correspondences; others (e.g., French, Danish, and English) are deeper in the sense of containing more inconsistent correspondences between phonemes and graphemes (Seymour et al. 2003; Ziegler et al. 2010). Research has indicated that in transparent orthographies, the relationship between phonological awareness and code-related literacy skills is somewhat weaker than in deep orthographies (Aro & Wimmer 2003; Georgiou et al. 2008; Moll et al. 2014), and phonological awareness is more strongly related to spelling than to decoding (Landerl & Wimmer 2008; Moll et al. 2014).

The present study is conducted among children whose native language is Estonian or Russian. The Estonian language belongs to the Finnic branch of the Finno-Ugric language family, sharing much in common with Finnish (see Dasinger 1997). Russian belongs to the Indo-European

language family and to the East Slavic branch (along with Belarusian, Ukrainian, and Rusyn) (Kornev et al. 2010). The orthographies of the Estonian and Russian languages are relatively transparent, being generally guided by phonemic principles (see Viise et al. 2011, for Estonian; Kornev et al. 2010; Rakhlin et al. 2014, for Russian). As in other alphabetic languages, phonological awareness measured in preschool is significantly related to decoding and spelling skills in Estonian (Kikas et al. 2016) as well as in Russian (Rakhlin et al. 2014; 2019).

1.2. Gender differences in literacy

In educational research, gender differences in literacy achievement have been studied for several decades. Large-scale international studies have repeatedly shown better performance of girls in literacy assessments. For example, the PISA surveys have indicated that girls outperforme boys in reading comprehension in all participating countries (OECD 2016; 2019) while boys are overrepresented among students with reading difficulties (Quinn 2018; Quinn & Wagner 2015). Gender differences have also been found in writing skills (e.g., Adams & Simmons 2019; McTigue et al. 2020; Reynolds et al. 2015). Moreover, research has found that even before formal schooling, girls tend to outperform boys in several preliteracy skills, such as vocabulary (Lange et al. 2016; Manu et al. 2020), comprehension of orally presented sentences and stories (Lange et al. 2016), and phonological awareness (Below et al. 2010; Lundberg et al 2012; McTigue et al. 2020; Manu et al. 2020).

Girls' advantage over boys in literacy achievement has been explained by differences in motivational and behavioural factors, brain activation when solving language-related tasks, cognitive abilities, awareness of reading strategies, and learning styles (see Logan & Johnston 2010). However, as gender effects vary remarkably between countries (OECD 2016), the reasons behind gender differences in literacy achievement might be partially explained by differences in learning environments in school. Indeed, a recent large-scale study from Norway showed that, although

gender differences in early literacy existed at school entry, they substantially attenuated with formal schooling in early school years. Thus, they did not directly lead to boys' long-term underachievement in literacy (McTigue et al. 2020). Another example comes from Finland (Manu et al. 2020), where children's pre-reading was assessed in kindergarten (age 6) and their reading comprehension in ninth grade (age 15). The study showed that the gender effect on reading comprehension found in the ninth grade was only partially mediated via kindergarten pre-reading skills. The authors suggested that the gender difference found in reading comprehension when students were 15 years old did not appear to be pronounced in kindergarten but rather emerged during the school years (Manu et al. 2020).

1.3. Students studying in different languages in Estonian school system

The school system in Estonia is organised in three sequential levels: pre-primary education (up to 7 years of age), basic education (grades 1–9, typical ages 7 to 16 years), and upper secondary education (grades 10–12, typical ages 16 to 19 years). During the Soviet period, a separate educational system with either Estonian or Russian as the language of instruction was established in Estonia. After the restoration of independence (1991), the Estonian educational system remained segregated by languages of instruction.

In recent decades, the proportion of students studying in Estonian has increased: in 1990s, the share of students studying in Estonian was 70%, but it has since risen to approximately 80% (Põder et al. 2017). Currently (study year 2020/2021), 79.2% of children attend kindergartens with Estonian as the language of instruction, 15.2% attend kindergartens with Russian as the language of instruction, and 5.3% attend kindergartens that apply an Estonian language immersion programme. Similar proportions occur in basic schools, where 80.2% of students study in schools with Estonian as the language of instruction, 13.9% attend

Russian-language schools, and 5.1% attend schools with an Estonian language immersion program (Ministry of Education and Research, n.d.). For children studying in Estonian and Russian, national curricula in preschool and basic school (Government of the Republic of Estonia 2008; 2011) are identical in objectives, principles, and content (the only differences exist in the instruction of Estonian and Russian that might be the first or foreign language to be taught).

The benefits and shortages of the language-segregated educational system in Estonia have long been debated. Although the IELS study conducted among kindergarten children showed that Russian-speaking children had somewhat better pre-academic skills than their Estonian speaking peers (OECD 2020a), the main argument against the segregated system comes from findings according to which the students in schools with Russian as the language of instruction perform lower than their peers studying in Estonian-medium schools. This in turn hinders the Russian speakers' further educational and career opportunities. In all PISA surveys including Estonia (since 2006), 15-year-old students in Russian-medium schools have performed lower than their peers in Estonian-medium schools in reading, mathematics, and science (Henno & Kitsing 2008; Kitsing 2011; Ministry of Education and Research and Innove Foundation, n.d.; Tire et al. 2013, 2016, 2019). In the most recent PISA survey, students in Russian-medium schools scored on average 42 points less than students in Estonian-medium schools in reading literacy (OECD 2020b), corresponding to more than one study year in school.

The reasons behind the significant differences in academic performance between students who study in Estonian and Russian have been examined by several researchers. Lindemann (2013) showed that, although individual social background (parents' highest occupational position, educational level, and cultural resources) was an important predictor of educational performance for both Russian- and Estonian-speaking students, it did not explain the lower performance of Russian students. Recent findings refer to the lower effect of social background (measured as the education level of the father) on the academic

achievement for those students who attend schools with Russian than for those who attend schools with Estonian as the language of instruction (Põder et al. 2017).

Some evidence suggests that the varying pedagogical beliefs between teachers in Estonian- and Russian-medium kindergartens and schools might explain the discrepancies in students' attainment: whereas Estonian teachers more emphasised children's own activeness and learning from each another (i.e., they strongly acknowledged the child-centred approach in the learning process), the Russian teachers stressed the activities initiated by the teacher, valuing teacher-centred teaching practices more (Loogma et al. 2009; Ugaste et al. 2014). In addition, the use of teaching practices has been found to differ between teachers in Estonian- and Russian-medium schools: teachers in Russian-medium schools have reported a greater preference for teacher-centred practices in their daily work (Suviste et al. 2017).

Previous research suggests that if teacher-centred practices dominate in the classroom, students' academic development is not supported as much as in classrooms where teachers use mainly child-centred or combine teacher-centred and child-centred teaching practices (Kikas et al. 2018; Suviste et al. 2017; Tang et al. 2017). Thus, Russian students' lower performance in academic skills might at least partly be caused by differences in teachers' pedagogical beliefs and daily practices applied in schools with different languages of instruction.

1.4. Present study

This study aimed to examine the effects of language (Estonian and Russian) and gender on children's test performance in vocabulary, sentence comprehension, narrative comprehension, and phonological awareness. The following research question was asked:

> What main effects and interaction effects do language and gender have on children's vocabulary, sentence comprehension, narrative comprehension, and phonological awareness?

2. Method

The data were collected in IELS in 2018 (OECD 2020a). The present study focuses on the results of emergent literacy of Estonian children. All tasks were available in Estonian and Russian, and the language of assessment was chosen according to the child's mother tongue.

2.1. Sample

In this study, a stratified two-stage probability sampling design was employed (for detailed description, see OECD 2021). At the first stage, kindergartens were randomly sampled from a list of kindergartens that were expected to provide education and care for children of the target age (i.e., 5 years). In the second stage, children were randomly selected from lists of all eligible children within the sampled kindergartens. After sampling, parents were contacted to ask their informed consent. The initial sample in Estonia consisted of 2110 children from kindergartens with either Estonian or Russian as the language of instruction (n = 1635 and n = 475, respectively). For the majority of children (97.4%), their mother tongue was the same as the language of their kindergarten.

In the present study, data from children with the same mother tongue and same language of instruction at kindergarten were analysed. The final sample comprised 1611 (78%) Estonian and 444 (22%) and Russian-speaking children who attended kindergartens with Estonian and Russian as the language of instruction, respectively. Both samples included 50% boys and 50% girls. The Estonian children attended 167 kindergartens and the Russian children attended 57 kindergartens from different parts of Estonia. The Estonian children were approximately one month younger (M = 5.50 years, SD = 0.28) than the Russian children (M = 5.58 years, SD = 0.28), t(2052) = −5.26, p < .001, d = 0.29.

2.2. Procedure

Participation in the study was voluntary for kindergartens and for the participants. Only those children whose parents gave their informed consent participated in the study. Children took the test using tablets, with a trained staff member present at the kindergartens. The assessment was administered individually, with one-to-one support from a trained study administrator. The assessment of emergent literacy took place in one day, and the assessment activity took approximately 15 minutes.

Before completing the test items, sample tasks were presented to the children to prepare them to operate the tablets. All instructions were presented orally, and the participants were asked to answer multiple choice questions by touching or moving items on the screen. There was no reading or writing involved in the assessment, only visual and audio materials. The study administrators ensured that each activity was ready before the children started taking the test, and they supported the children in navigating the activities.

2.3. Assessment instruments

The instrument included tasks from three domains: listening comprehension (narrative and sentence comprehension), vocabulary, and phonological awareness. This subsection presents a description of each task and the results for controlling the Estonian and Russian versions' equality.

2.3.1. Narrative comprehension

Children were asked to listen to a narrative text and then answer multiple choice questions about the story. The story was about domestic animals' (cat, horse, sheep, and chicken) preparation for winter. During the aural presentation of the story, illustrations of the characters and events were presented on the screen. Narrative comprehension was assessed

using seven multiple choice questions, with three alternatives for each question. While answering, the children had an opportunity to listen to the story paragraphs once again. Answering each question was obligatory. The sum score of correct answers gave the final score of narrative comprehension (Max = 7). Cronbach's alphas for the Estonian and Russian versions were .71 and .68, respectively.

To control that the Estonian and Russian test versions were equal, the story, comprehension questions, and answers in Russian were translated into Estonian, and the original and translated Estonian versions were compared. Information included in the narratives as well as the distribution between sentences was the same in both the original and translated versions. The lengths of the original and translated versions were highly similar: the numbers of words were 131 and 130, respectively, and both versions included 14 sentences. The mean number of words in a sentence was 9.36 (SD = 5.62) in the original story and 9.29 (SD = 4.71) in the translated text, being similar according to the paired t-test, $t(13) = 0.11$, $p = .91$, $d = 0.01$. The comprehension questions and answers were the same in content and similar in terms of sentence length: the mean number of words in a sentence was 7.00 (SD = 3.06) in the original version and 7.29 (SD = 4.39) in the translated version, $t(6) = -0.37$, $p = .73$, $d = 0.08$. Thus, the texts, comprehension questions, and answers were highly similar in terms of content, sentence structures, and the mean length of sentences.

2.3.2. Sentence comprehension

In the sentence comprehension task, children listened to seven compound sentences and chose an answer (from three alternatives) to a question about each sentence (e.g., *The man is smiling because he found his lost book. Why is the man smiling?* – 1) *He has got his book back;* 2) *The book is funny;* 3) *Somebody has given him the book*). During the presentation of the sentences, questions, and answers, a thematic illustration was presented on the screen (e.g., a smiling man). Answering all

questions was obligatory. Each correct answer earned one point (Max = 7). Cronbach's alphas for the Estonian and Russian versions were .61 and .70, respectively.

To control the equality of the task in Estonian and Russian, all sentences, questions, and answers were translated from Russian into Estonian, and the original and translated Estonian versions were compared. All items were the same in content. The sentences had the same structure and were similar in terms of the number of words: 7.93 (SD = 5.08) in the original version and 7.87 (SD = 4.96) in the translated version, $t(14) = 0.32$, $p = .75$, $d = 0.01$.

2.3.3. Vocabulary

In the vocabulary task, children listened to a sentence and indicated the meaning of one word in the sentence by choosing the correct answer from three alternatives (e.g., *The dog is exhausted. What does "exhausted" mean?* – 1) *Tired;* 2) *Hungry;* 3) *Old.*). During the presentation of the sentences and answers, a thematic illustration was presented on the screen (e.g., an exhausted dog). The task consisted of five items, and each correct answer earned one point (Max = 5). Answering all questions was obligatory. Cronbach's alphas for the Estonian and Russian versions were .55 and .68, respectively.

To control the equivalence of the task of the Estonian and Russian test versions, word frequencies of the stimulus and answer words among the most frequent 10,000 lemmas in both languages were compared using frequency lists in Estonian (Kaalep & Muischnek 2002) and Russian (Ljashevskaja & Sharov 2009). According to the Wilcoxon signed-rank test, words on the Russian test occurred slightly (but not significantly) more frequently in the Russian language (Mdn = 110.5) than Estonian words in the Estonian language (Mdn = 21.5), $T = 54$, $Z = 1.90$, $p = .06$.

2.3.4. Phonological awareness

Phonological awareness was assessed using a task that required children to detect the first, last, or middle phoneme of a word. Three words, each followed by three alternative answers (phonemes), were presented orally. Before each item, an example was given (e.g., *The middle sound in the word "kann"* ([kɑnː]¹ 'jug') *is "a"*); thereafter, the test item was presented (e.g., *What is the middle sound in the word "siit"* ([siːtː] 'from here'*?"*) – 1) *a*, 2) *u*, 3) *i*). The stimulus words were simple in structure, consisting of 1–2 syllables. Each correct answer earned one point (Max = 3). Cronbach's alphas for the Estonian and Russian versions were .72 and .70, respectively.

To examine the equality of the task items on the Estonian and Russian tests, phonological structures of stimulus words and phonemes presented for answer options were compared. The first phoneme had to be chosen in either Estonian or Russian words *tigu* (['tikuˑ] 'snail') and *тигр* (['tʲigr] 'tiger'), and the options for the answer were *k, v, t*, and *k, b, t*, respectively. Both stimulus words consisted of two syllables but differed for phonological structures (CVCV in Estonian, CVCC in Russian). The target phoneme and the following phoneme were the same (*t* and *i*) in the test versions. In the Estonian test, the other answer options consisted of one phoneme included in the stimulus word (*k*) and one phoneme not included in the stimulus word (*v*); in the Russian version, both inappropriate answer options were phonemes not included in the stimulus word (*k* and *b*). The middle phoneme had to be detected in either the Estonian word *siit* ([siːtː] 'from here') or Russian word *сыр* (['sɨr] 'cheese'), and answer options were *a, u, i*, and *a, u, ɨ*, respectively. In both test versions, the stimulus word consisted of three phonemes with a similar phoneme structure (CVC), and the target phoneme was a vowel located between consonants. Similarly, in the test versions, the answer options were vowels, and the inappropriate options were not included in the stimulus

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¹ The International Phonetic Alphabet (https://www.internationalphoneticassociation.org/content/ipa-chart) was used for the phonological representation of the sample words.

word. The last phoneme had to be detected in the Estonian and Russian words *sall* ([sɑlʲːː] 'scarf') and *шум* ([ˈʂum] 'noise'), and answer options were *n*, *t*, *l*, and *r*, *g*, *m*, respectively. In both versions, the stimulus word had a similar phoneme structure (CVC), and the target phoneme was a consonant, preceded by a vowel. The answer options were consonants, and the inappropriate options were not included in the stimulus word. To sum up, the analysis showed that, despite slight differences, the phoneme awareness tasks on the Estonian and Russian test versions were rather similar for their difficulty levels.

2.4. Data analysis

To examine Estonian and Russian children's test results, Analyses of Covariance (ANCOVA) was used. To analyse the main effects of language (Estonian, Russian) and gender (girls, boys) on test performance of each domain, separate ANCOVAs were run with language and gender as the independent factors, age as a covariate, and test result as the dependent factor. As a next step, the interaction effect of language and gender on test results was added to the model.

3. Results

Descriptive statistics of Estonian and Russian children's test results and the correlations between variables are presented in Table 1.

First, we examined the narrative comprehension of Estonian and Russian girls and boys (Figure 1). The ANCOVA revealed the main effect of gender, showing better test performance among girls, $F(1, 2036) = 6.10$, $p = .01$, $\eta_p^2 = .003$. No main effect of language [$F(1, 2036) = 1.64$, $p = .20$, $\eta_p^2 < .001$] or interaction effect of language and gender occurred, $F(1, 2038) = 0.86$, $p = .36$, $\eta_p^2 < .001$.

In sentence comprehension, we found the main effect of gender, indicating the higher performance of girls [$F(1, 1986) = 9.68$, $p = .002$, $\eta_p^2 = .005$], and the main effect of language, referring to the higher

TABLE 1. *Results of emergent literacy tasks and ages of Estonian and Russian children and Pearson correlation coefficients (the right side of the table) in Estonian subsample (below the diagonal) and Russian subsample (above the diagonal)*

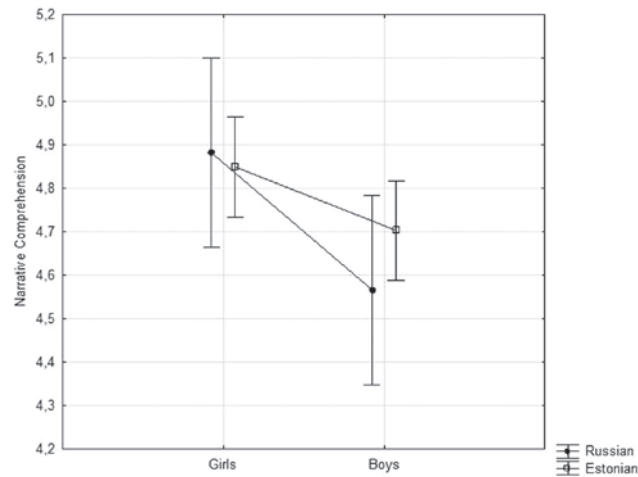| Variable	Estonian children				Russian children				Correlations				
	n	Min-Max	M	SD	n	Min-Max	M	SD	1.	2.	3.	4.	5.
1. Narrative comprehension	1599	0–7	4.78	1.68	441	0–7	4.72	1.56	–	.53*	.40*	.28*	.11*
2. Sentence comprehension	1554	0–7	4.00	1.66	436	1–7	4.39	1.71	.52*	–	.50*	.31*	.14*
3. Vocabulary	1555	0–5	2.93	1.29	436	0–5	3.24	1.30	.39*	.41*	–	.20*	.18*
4. Phonological awareness	1573	0–3	1.35	1.07	436	0–3	1.92	1.01	.13*	.11*	.08*	–	.04
5. Age (in years)	1611	4.92–6.08	5.50	0.28	443	5.04–6.09	5.59	0.28	.14*	.13*	.14*	-.02	–

Note. * p < .05.

FIGURE 1. *Narrative comprehension of Estonian and Russian boys and girls: arithmetic means and 95% confidence intervals*

performance of Russian children, $F(1, 1986) = 13.89$, $p < .001$, $\eta_p^2 = .007$ (Figure 2). Gender and language interacted in affecting children's test results in sentence comprehension (borderline statistical significance), reflecting significant gender discrepancies favouring girls in the Russian subsample, $F(1, 1988) = 3.81$, $p = .051$, $\eta_p^2 = .002$.

In vocabulary, the ANCOVA showed the main effect of language, indicating Russian children's higher results, $F(1, 1987) = 13.57$, $p < .001$, $\eta_p^2 = .007$, as well as the main effect of gender, pointing to the girls' higher scores, $F(1, 1987) = 18.50$, $p < .001$, $\eta_p^2 = .009$ (Figure 3). Language and gender did not interact in affecting test results, $F(1, 1989) = 0.02$, $p = .88$, $\eta_p^2 < .001$.

Finally, in terms of phonological awareness, the ANCOVA revealed the main effect of language, reflecting the higher results of Russian children, $F(1, 2005) = 99.38$, $p < .001$, $\eta_p^2 = .047$. No main effect of gender [$F(1, 2005) = 1.85$, $p = .17$, $\eta_p^2 < .001$] or interaction effect of language and gender was found, $F(1, 2007) = 2.57$, $p = .11$, $\eta_p^2 = .001$ (see Figure 4).
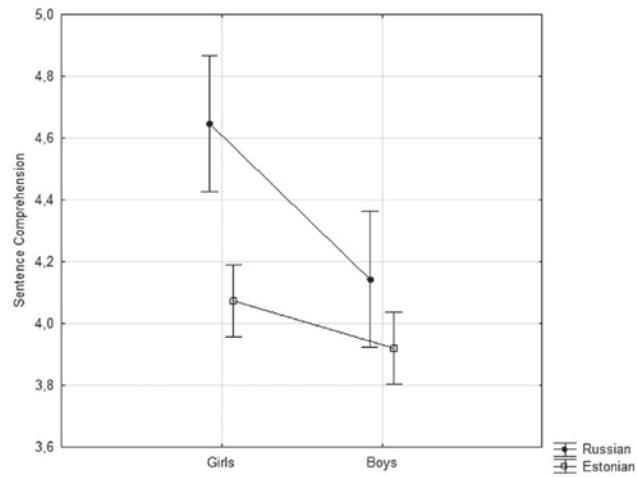
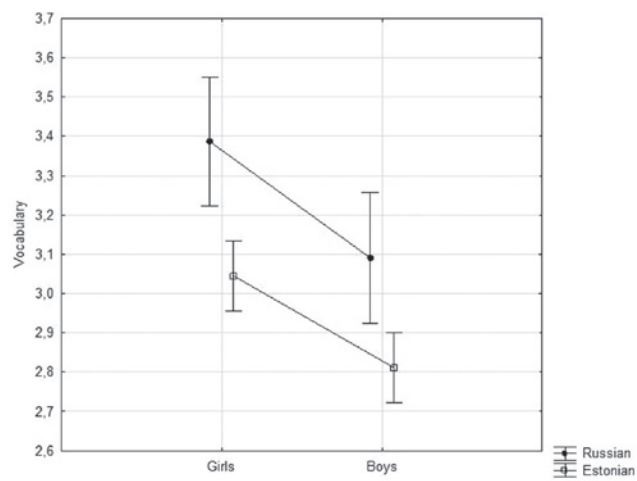**FIGURE 2.** *Sentence comprehension of Estonian and Russian boys and girls: arithmetic means and 95% confidence intervals*

FIGURE 3. *Vocabulary of Estonian and Russian boys and girls: arithmetic means and 95% confidence intervals*
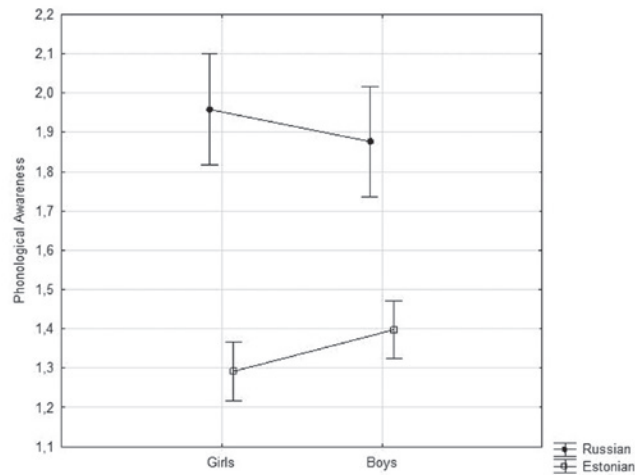
Figure 4. *Phonological awareness of Estonian and Russian boys and girls: arithmetic means and 95% confidence intervals*

4. Discussion

The current study examined the effects of language and gender on emergent literacy subskills of five-year-old children in Estonia. The study was based on the findings of the international large-scale study IELS (OECD 2020a) that revealed significant differences in emergent literacy between Estonian- and Russian-speaking children as well as gender discrepancies in the Russian sub-sample in Estonia. These findings initiated the current research to investigate Estonian children's performance in emergent literacy in more detail, separately in vocabulary, sentence comprehension, narrative comprehension, and phonological awareness. In the majority of the tasks, we found gender effects on children's test scores showing better performance of girls compared to boys, and language effects indicating better results of Russian-speaking children compared to their Estonian-speaking peers. No statistically significant interaction effects of gender and language on children's test scores were found.

First, we examined the gender effect on subskills of emergent literacy. The results indicated significant gender effects on all three oral language skills assessed in the study: girls outperformed boys in lower-level language skills (vocabulary and sentence comprehension) as well as higher level skills (narrative comprehension). This result, showing significant gender effects on oral language skills, is in line with previous findings from Germany (Lange et al. 2016) and Finland (Manu et al. 2020). However, like in previous studies, the effect sizes were very small, indicating the limited practical relevance of the results. Moreover, previously identified gender differences in phonological awareness (Below et al. 2010; Lundberg et al. 2012; McTigue et al. 2020; Manu et al. 2020) did not occur in the present study. As phonological skills are typically developed through explicit literacy focused instruction (e.g., detecting sounds in words, matching sounds and letters), unlike language comprehension skills that develop mostly implicitly through natural oral interaction with adults and peers, our results might point to effective instructional practices used in Estonian kindergartens that prevent the lag in boys' phonological skills. This assumption is supported by a large-scale study from Norway that indicated the effect of formal literacy instruction taking place in first and second grades on boys' initial lag in early literacy at school entry (McTigue et al. 2020).

Second, the most striking result of the current study was the significant (albeit small) language effect on emergent literacy: results of three out of four tasks (i.e., sentence comprehension, vocabulary, and phonological awareness) were higher among Russian children than their Estonian peers. This finding is novel because no previous research has been conducted among Estonian- and Russian-speaking preschool children. The results indicates that emergent literacy instruction is somewhat more effective in kindergartens with Russian as the language of instruction than Estonian-medium kindergartens in Estonia, despite the same national curriculum for preschool childcare institutions (Government of the Republic of Estonia 2008).

A possible reason for this finding may lie in differences in teachers' beliefs about learning and teaching practices in kindergartens with different languages of instruction. Previous research conducted in Estonia (Loogma et al. 2009; Suviste et al. 2017; Ugaste et al. 2014) has indicated that teachers in Russian-medium kindergartens and schools emphasised more teacher-initiated activities in the learning process (drilling of basic skills, frequent checking of children's activities, direct supervision of students) than their colleagues in kindergartens and schools with Estonian as the language of instruction who, in turn, valued more child-centred practices (emphasising active engagement of students, self-initiated activities by children, the fostering of children's social development, and creative activities).

Thus, Russian-speaking children's higher performance in emergent literacy tasks may be related to more formal instruction that characterises teacher-centred practices. Similar to previous studies that have shown the positive effect of teacher-centred teaching practices on young children's learning outcomes (Chien et al. 2010; Goble et al. 2016; Goble & Pianta 2017), Russian-speaking children's higher performance in emergent literacy tasks found in the current study may be related to the more formal instruction characteristics of teacher-centred practices.

In contrast, in educational settings with child-centred nature, where the self-selection of literacy activities is more emphasized, some children may be more inclined to select literacy activities such as phonics games and letter puzzles, whereas the others may be more inclined to select nonliteracy activities, such as block building. Previous studies have found that children who spend the most time in free-choice settings selecting what and where to play or learn, make smaller gains in important domains of development such as early literacy and mathematics (Chien et al. 2010; Goble et al. 2016).

However, although the dominance of teacher-centred practices in the classroom may have positive impact on young children's academic skills (Chien et al. 2010; Goble & Pianta 2017), it is known that it hinders students' learning motivation (Guthrie et al. 2000; Stipek et al. 1998) and

long-term academic development (Lerkkanen et al. 2012; Stipek et al. 1998). The positive effect of child-centred teaching practices and the negative effect of teacher-centred activities have been found as early as the first grades in Estonian schools (Kikas et al. 2018). Thus, Russian children's initial advantage over their Estonian-speaking peers in emergent literacy, if being related to teaching practices applied in kindergartens, might not be long-lasting in their further literacy development. However, as teaching practices applied by teachers were not assessed in the present study, we cannot claim that different teaching practices influenced children's skills in Estonian- and Russian-medium kindergartens. In future research, teachers' beliefs, knowledge, and teaching practices and their impact on children's academic as well as social development and well-being in different cultural linguistic contexts should be examined.

Although the present cross-sectional study did not affirm that Russian-speaking children's initial advantage of emergent literacy over their Estonian peers disappears in further formal schooling, we might assume that this would likely happen based on the PISA results, which have constantly shown significantly lower reading performance among 15-year-old students in schools with Russian as the language of instruction (Henno & Kitsing 2008; Kitsing 2011; Ministry of Education and Research and Innove Foundation, n.d.; Tire et al. 2016, 2019). To deeply understand the strengths and weaknesses of the learning environment of kindergartens and schools with different languages of instruction, observational studies combined with an assessment of children's skills are needed to evaluate actual learning processes taking place in classrooms. Only a few observational studies have been conducted in Estonian schools (Kikas et al. 2018; Ruotsalainen et al. 2022; Tang et al. 2017), but research carried out in schools and kindergartens with different languages of instruction is lacking.

The present study has some limitations that should be considered when generalising the results. First, the instrument of emergent literacy allowed this study to assess each target subskill using only one task.

Thus, although the assessment was time-efficient and not overloading for children, it did not measure children's skills thoroughly. However, considering the amount of time spent and human resources needed for the individual assessment of a large number of children's skills in a wide spectrum of skill domains (emergent literacy and numeracy, self-regulation, and social and emotional skills) in IELS, this methodological restriction is justified. Second, the internal consistency (Cronbach's alphas) of the vocabulary task was rather low. Third, as the study was cross-sectional and teachers' pedagogical beliefs and practices were not assessed, teacher-related effects on children's performance discussed herein can only be hypothesised in the present study. And finally, home learning environment as a significant factor influencing children's academic development was not taken into account in the present study. To collect more comprehensive information about children's achievement, exploring learning growth and factors related to their development, using multiple methods at several time points, is suggested.

5. Conclusions

This study sheds light on five-year-old children's subskills of emergent literacy in two cultural linguistic contexts in Estonia. The findings indicate that children in kindergartens with Russian as the language of instruction outperformed their Estonian-speaking peers in the majority of emergent literacy skills assessed in the study. As the analyses demonstrated high equality of the instrument of emergent literacy in Estonian and Russian languages used in the study, we conclude that differences in test results reflect the actual discrepancies of emergent literacy skills between the groups of children. Thus, we assume that the lower reading performance of students in Estonia's Russian-medium schools, as consistently found in the PISA surveys, do not have their roots in preschool education but are rather a result of formal schooling later on. The study indicates the need for further research focusing on the associations of children's development and learning environment in different

cultural linguistic school settings in Estonia as well as in other countries. In today's world, where multicultural and multilingual societies are more the rule than the exception, the questions about how to support academic and social-emotional development of each student, including those from diverse backgrounds, are of great importance.

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Eesti ja vene 5-aastaste laste kujunev kirjaoskus – mis alaoskused on erinevuste taga?

PIRET SOODLA, TIIU TAMMEMÄE
Tallinna Ülikool

2018. aastal viidi Eestis läbi rahvusvaheline alushariduse ja laste heaolu uuring IELS (OECD 2020a). Uuriti 5-aastaste laste kujunevat kirjaoskust, arvutamis-oskust, eneseregulatsiooni- ja sotsiaal-emotsionaalseid oskusi. Käesolevas uuringus keskendusime eesti laste tulemustele kujunevas kirjaoskuses. Eesmärk oli kirjeldada keele ja soo mõju laste sooritusele sõnatähenduse tundmises, lau-sete ja teksti mõistmises ning fonoloogilises teadlikkuses. Lähtuvalt eesmärgist püstitasime järgmise uurimisküsimuse: missugune on keele ja soo peamõju ja koosmõju laste sõnatähenduse tundmisele, lausete mõistmisele, tekstimõistmi-sele ja fonoloogilisele teadlikkusele?

Valimisse kuulusid eesti emakeelega lapsed, kes käisid eesti õppekeelega lasteaias (N = 1611), ja vene emakeelega vene õppekeelega lasteaias käivad lapsed (N = 444). Sooline jaotuvus valimites oli võrdne: tüdrukuid oli 50% ja poisse 50% nii eesti kui ka vene valimis. Laste vanus uuringu hetkel oli keskmi-selt 5,52 aastat (SD = 0,28). Lapsed sooritasid tahvelarvutis ülesandeid, millega hinnati sõnatähenduse tundmist, lausete ja jutustava teksti mõistmist ja fono-loogilist teadlikkust.

Tulemused näitasid, et keel ja sugu avaldasid enamike alaoskuste osas mõju laste tulemustele, peegeldades vene laste mõnevõrra kõrgemaid testitulemusi kui eesti lastel ning tüdrukute paremaid oskusi, võrreldes poistega.

Siinne uuring on esmakordne laiapõhjaline võrdlev uurimus, mis on läbi viidud eesti ja vene lasteaialaste hulgas. Kuna uurimuse analüüsis ilmnes, et eesti- ja venekeelsed hindamisvahendid olid raskusastmelt väga sarnased, saame järeldada, et erinevused testitulemustes eesti ja vene laste vahel ei tulenud tes-tide spetsiifikast, vaid olid pigem seotud hinnatavate oskuste erinevustega eesti ja vene laste vahel. Seega võib oletada, et PISA uuringutes korduvalt näidatud vene õppekeelega koolide õpilaste mahajäämus eesti õpilastest lugemisoskuses ei saa alguse mitte lasteaiast, vaid on pigem seotud õpetamise vajakajäämistega

põhikoolis. Leitud seosed keele ja soo ning kujuneva kirjaoskuse alaoskuste vahel osutavad edasise uurimistöö vajalikkusele, mis peaks keskenduma vene ja eesti õppekeelega lasteaedade ja koolide õpikeskkonna ja laste arengu vahelistele seostele.

Võtmesõnad: lugemise ja kirjutamise eeloskused; sõnatähenduse tundmine; keeleline mõistmine; fonoloogiline teadlikkus; eesti keel; vene keel

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