Literacy Instruction Activities and Their Associations with First Graders' Reading Performance in Two Transparent Orthographies

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Abstract

The aim of the study was to analyse literacy instruction activities and their associations with the reading performance of first graders in Estonia and Finland, two countries that share similar orthographies and educational systems but differ in the onset of formal reading instruction. The contents of 33 Literacy lessons in first grade spring were analysed and students' (N_{EST} = 415, N_{FIN} = 154) reading performance was assessed in first grade autumn and spring. The results showed that there were more similarities than differences between the countries in literacy instruction activities, but some country-specific interaction effects were found between students' reading performance and contents of the instruction. Especially the slopes of reading performance development among Finnish beginning readers differed from the other readers in both countries with respect to the content of literacy instruction. The results highlight the importance of responsiveness to students' needs in early school years literacy instruction.

Keywords: reading fluency, reading comprehension, literacy instruction, first grade, transparent orthography

Introduction

Reading proficiency requires the development of both decoding and comprehension skills (Gough & Tunmer, 1986) as well as instructional practices that address both of these areas (Connor, Morrison, & Katch, 2004). Estonia and Finland provide an interesting comparative context as they both have languages with transparent orthographies, and in both countries, students enter school at the age of seven. However, the onset of formal reading instruction takes place in kindergarten in Estonia but in first grade in Finland. Earlier findings (Soodla et al., 2015) have shown that in spite of the later onset of instruction, Finnish students on average reach the same level of reading fluency and reading comprehension as their Estonian peers by the end of first grade. In addition, small but significant differences emerge in reading comprehension in second grade in favor of Finnish students (Soodla, Torppa, Kikas, Lerkkanen, & Nurmi, 2019).

Instruction in first grade has been shown to have a greater impact on students' reading skills than instruction in other grade levels (Connor et al., 2013). The characteristics of first grade instruction may help to explain why the earlier onset of reading instruction does not seem to give long-term advantages to Estonian students over Finnish students. The need for balanced instructional practices that support both the development of students' foundation-level code-focused (CF) skills of decoding and reading fluency and the broad advancement of meaning-focused (MF) comprehension skills has been widely acknowledged (e.g., Connor, Morrison, & Katch, 2004; Kendeou, van den Broek, White, & Lynch, 2009). Yet, analyses of the effects of specific instructional practices at these differentiated levels from classroom observations are rare. Previous research has predominantly focused on the effects of different types of literacy programmes or interventions (e.g., González-Valenzuela & Martín-Ruiz, 2017), students at-risk for reading difficulties (Swanson, 2008), and the overall quality of teaching style (e.g., Tang et al., 2017).

The present study employs a cross-country comparison to examine instructional activities used in first grade Literacy lessons in Estonia and in Finland, and their associations with students' reading performance at the first grade. In the classroom observations and analysis of literacy instruction activities, the *Individualizing Student Instruction* (ISI) observation system (Connor, Morrison et al., 2009) was adapted for the first time in Estonia and Finland to examine the CF and MF content of instruction.

Emerging Literacy Skills

A central aim of entry-level formal schooling is setting a strong foundation for students' literacy skills. Thus, it is important to be aware of the most effective teaching practices in the classroom. The Simple View of Reading (SVR; Gough & Tunmer, 1986), which is a widely used theoretical account on reading, suggests that reading comprehension is a composition of efficient decoding skills and linguistic comprehension of which development are affected by somewhat different cognitive antecedents (Torppa et al., 2016). Linguistic comprehension and vocabulary develop through informal and formal exposure to interactions throughout one's life, whereas acquiring the ability to decode words is a more rapid process where students must master a constrained amount of letter-sound combinations and the alphabetic principle (Paris, 2005). Typically, in transparent orthographies the acquisition of decoding skill takes place soon after reading instruction has begun and students advance to a rather fluent reading level after the first year of school (Lerkkanen, Rasku-Puttonen, Aunola, & Nurmi, 2004). Although vocabulary and linguistic comprehension have been shown to be stronger long-term predictors of reading comprehension than decoding or reading fluency, the significance of fluency is evident during the first school years (e.g,. Torppa et al., 2016).

Literacy Instruction in First Grade

At the entry-level stage of formal reading instruction, students present a wide spectrum of skill profiles, which challenges the classroom teacher to adapt his or her instruction to correspond to the students' various skill levels (Connor, Morrison, & Katch, 2004). The sensitivity of the teacher to take a student's skills into account and tailor the instruction has been shown to contribute to the development of students' reading skills (Connor et al., 2013). A heavier emphasis on activities that support the development of CF skills, for example through letter knowledge, phonological awareness, and decoding tasks, is commonly needed in the beginning of the first school year, whereas the focus may later shift towards incorporating more MF activities (Connor, Morrison, & Katch, 2004). For students who struggle in the early reading acquisition phase, a longer period of time practising CF skills is required (Connor et al., 2013). Thus, balancing the types and emphases of literacy instruction at individualised level is important based on students' different skills (Connor, Morrison, & Katch, 2004) and particularly for students who are at risk of reading difficulties (Puliatte & Ehri, 2018).

In their framework and observational coding scheme of literacy instruction, Connor, Morrison, and colleagues (2009) focus on three dimensions that capture the variations in literacy instruction. These comprise the context (e.g. whole vs. small group instruction), management (e.g., teacher vs. child managed direction of attention), and content of instruction. The present study centers on the *content* of literacy instruction which contains the categories of CF or MF activities. *CF* activities aim at providing support for early decoding and spelling skills, such as blending phonemes, or doing spelling exercises, and later, practising reading fluency. In contrast, *MF* activities seek to support students' comprehension skills via meaning-based discussions and reading comprehension tasks, for example.

In the beginning phase of reading acquisition, students benefit from the explicit instruction of CF skills (Connor, Morrison, & Underwood, 2007) and practising of comprehension skills together with the teacher (Connor, Morrison, & Petrella, 2004). For those students who can already decode, independent practising of reading fluency and comprehension would rather support them in consolidating their skills towards better reading performance (Connor, Morrison, & Katch, 2004; Connor, Morrison, & Underwood, 2007).

The two languages of focus in the present study, Estonian and Finnish, belong to the Baltic-Finnic group of the Finno-Ugric family of languages. The languages are not mutually intelligible, but have many commonalities such as complex morphologies but highly transparent orthographies and some common lexicon (e.g., number one is üks [/yks/] in Estonian and yksi [/yksi/] in Finnish). Both are agglutinative languages, meaning that grammatical roles as well as semantic information are indicated by inflectional suffixes (Kaivapalu & Martin, 2017). In both languages, phonetic speech-sound duration is used to carry meaning.

Because of the highly transparent orthography (almost perfect phoneme-grapheme correspondence) reading instruction is phonics based. After the first phonemes are introduced to students, phonemic assembly and progress towards full mastery of accurate decoding are relatively easy for beginning readers (Aro, 2017). Estonian children receive explicit instruction on reading one- to two-syllable words already in kindergarten, and thus, over 90% of children can read at least some words before the beginning of first grade (Soodla et al., 2015). In Finland children are not systematically taught to read in kindergarten, but their emerging literacy development is promoted by playful activities involving letters and phonological awareness activities (Lerkkanen, 2007). Even in the absence of formal reading instruction prior to school, approximately 30% of the Finnish children can already read upon entering school (Soodla et al., 2015).

The national core curriculum guidelines in Estonia concerning the kindergarten year (Vabariigi Valitsus, 2011/2018) emphasise practising foundation-level decoding accuracy and at the first grade on fluency, but in Finland (Finnish National Agency for Education, 2016), this particular emphasis on decoding spans the first school year while in kindergarten the focus is to support pre-literacy skills such as letter knowledge and phonological awareness. In both countries at school, seven 45 minutes lessons per week is allocated to literacy instruction in the first grade. The emphasis on supporting students' development of reading fluency and comprehension increases in both countries from first grade spring semester onwards. Both Estonian and Finnish teachers have high professional autonomy, which allows them to adapt and differentiate their teaching practices and pedagogical approach in their instruction.

The Aims of the Study

The present study examines the instructional activities during Literacy lessons in Estonia and Finland and their associations with students' reading performance during the first school year. The following research questions and hypotheses were set in the study:

1) How is literacy instruction implemented in the observed Estonian and Finnish classrooms in first grade spring? We expected (1a) to identify more MF activities, especially listening and reading comprehension activities, in the Estonian first grade classrooms in contrast to the Finnish context as Estonian students receive formal reading instruction for one year longer and their decoding skills are ahead of those of Finnish students at school entry (Soodla et al., 2015). Although teachers in both countries have reported providing individual support for students with poorer reading skills (for Estonian, see Kikas, Silinskas, Jõgi, & Soodla, 2016; for Finnish, see Kiuru et al., 2015), we expected (1b) to observe more individualised practices in Finnish classrooms as Finnish first graders are

likely to vary more in their literacy skills at school entry (Torppa, Soodla, Lerkkanen, & Kikas, 2019).

2) How are the amounts of time used for CF vs. MF literacy instruction contents in Estonian and Finnish classrooms associated with the students' reading performance (fluency and comprehension) in the spring of first grade? Are these associations similar for students with different entry-level reading fluency? We assumed (2a) that Estonian students' reading performance would be associated more with high amount of MF activities and that of Finnish students with high amount of CF activities because Estonian students' reading fluency is on average higher than those of Finnish students in first grade autumn (Connor, Morrison, & Katch, 2004; Connor, Piasta et al., 2009; Soodla et al., 2015). We further assumed (2b) that in both countries students showing the highest reading fluency would show higher reading comprehension performance when attending a classroom with greater amount of time on MF activities, whereas for beginning readers with low reading fluency reading comprehension would be associated with the presence of both CF and MF activities (Connor, Morrison, & Petrella, 2004; Connor et al., 2013).

Method

Participants and Procedure

The participants consisted of 33 classroom teachers (21 from Estonia, 12 from Finland) and a total of 569 students from 33 first grade classrooms. The Estonian sample is part of a longitudinal Reading Study study (Soodla et al., 2015), including classrooms from three municipalities in different parts of Estonia. The Finnish data are part of a longitudinal First Steps study (Lerkkanen et al., 2006–2016), of which the present sample comprises classrooms from two municipalities in Central Finland.

Teachers

Ten Estonian first grade teachers in spring 2012 and 11 teachers in spring 2013 in seven schools, and 12 Finnish first grade teachers in ten schools in spring 2008 participated in the classroom observations. The teachers filled out a questionnaire on their educational background and teaching experience. All 33 teachers (21 Estonian and 12 Finnish teachers) were female and their teaching experience was as follows, respectively: less than one year of experience (23.8% vs. 8.3%), 1–5 years (0% vs. 25%), 6–10 years (14.3% vs. 16.7%), 11–15 years (4.8% vs.16.7%), and more than 15 years of experience (57.1% vs. 33.3%). The majority (n = 18, 85.7%) of the Estonian teachers had a masters' degree in education, and three teachers (14.3%) had a bachelor's degree in education. All of the Finnish teachers had a masters' degree in education. The teachers of the two countries did not differ in their teaching experience ($\chi^2(4) = 8.37$, $p = .079$) or educational background ($\chi^2(1) = 1.89$, $p = .170$).

Students

The Estonian sample consisted of 415 students (51% boys; mean age of students in first grade autumn 88.07 months, SD = 3.82). The data were collected in two cohorts during the academic years 2011–2012 and 2012–2013. The Finnish sample consisted of 154 students (54% boys; mean age of students in first grade autumn 85.80 months, SD = 3.38) in the academic year 2007–2008. Mean class sizes were 19.76 students (SD = 2.86) in Estonia and 12.83 students (SD = 3.71) in Finland, respectively. The samples did not differ in terms of the distribution of students' gender, $\chi^2(1) = .49$, $p = .485$, but Estonian students were on average 2.6 months older, $t(565) = 6.47$, $p < .001$, and the Estonian class size was bigger, $t(31) = 6.00$, $p < .001$.

In both countries, the students' parents were asked to give their written informed consent for their own and their child's participation in the study. Three categories were

formed based on the parents' reported educational levels: 1) low level (less than secondary education, <12 yrs of education); 2) medium (secondary, 12 yrs of education); and 3) high (higher than secondary education, >12 yrs of education). The highest level of education in the family was included in the analysis. In Estonia, a total of 3% (10% in the general population based on Eurostat, 2013) of the families had a low educational level, 31% (52% in the general population) had a medium education level, and 65% (37% in the general population) had a high education level. The educational levels in Finland from low to high were: 3% (12% in the general population), 25% (46% in the general population), and 57% (42% in the general population), respectively. Parental educational levels were similar in Estonia and Finland ($\chi^2(2) = .30$, $p = .863$), but in both countries, the proportion of parents having the highest educational level was higher in the present sample than in the general population.

Measures

Classroom Observations of Literacy Instruction Activities

Observations in the classrooms were carried out in first grade spring (April) during three lessons on one day in Estonia and during three lessons on each of two days in Finland. The observations were scheduled at the teachers' convenience. In Estonia, all three lessons for each classroom were recorded using Dictaphones. In Finland, one of the lessons on both days was recorded using an MP3 recorder. Only the recordings of Literacy lessons were used in the present analyses. In eight cases in Estonia and in one case in Finland, two Literacy lessons were obtained. In these cases, the first Literacy lesson was included in the study. The lessons averaged 43 minutes in length (SD = 5.68 min; ranging from 27 minutes to 61 minutes). The length of the lessons did not differ between Estonian and Finnish classrooms ($\chi^2(32) = 33.00$, $p = .418$). Because of the variation in the length of the lessons, the results are presented as percentages of time of activities.

The Literacy lessons were coded with respect to the duration of the contents of instructional activities following the Individualizing Student Instruction (ISI) classroom observation system developed by Connor, Morrison and colleagues (2009). The detailed manual of the original ISI/Pathways coding system (Connor et al., 2010) was closely followed and revised to meet the language and content-specific features of Estonian and Finnish literacy instruction (adaptation by Poikkeus, Lerkkanen, Ruotsalainen, & Soodla, 2013). Instructional activities were coded using the Observer Pro software (Noldus Information Technology, 2001). The coding scheme included codes for content areas such as fluency and listening and reading comprehension, as well as non-instructional activities (e.g., transitions between activities or orientation). In the analysis phase, the codings assigned in each category (as durations in seconds) were summed under broader categories of *CF* and *MF* activities and non-instructional activities according to the manual. Classification of the codes of literacy instruction content activities into CF or MF categories is indicated in Table 1 via superscripts. In addition, the amount of individualising of literacy contents (e.g., the teacher gave at least two different tasks, such as writing at the word or sentence level) was included to the analyses as *individualised work*.

Every activity that lasted at least 10 seconds was coded. Two researchers carried out all of the codings (one from Estonia and one from Finland). Both of the researchers participated in adapting the ISI method for the Estonian and Finnish instructional contexts and languages. During the adaptation, examples from the data and suggestions for modifications to the coding manual were carefully discussed with the research team. For reliability analysis, four Estonian and four Finnish lesson transcripts were cross translated by a native Estonian who speaks fluent Finnish. Interrater agreement between the coders was calculated, and the percentage of full agreement was 88.8%.

Student Reading Performance

Students' reading skills were assessed using group-administered tests in the classrooms in first grade autumn (reading fluency) and first grade spring (reading fluency and reading comprehension). The reading measures were drawn from a Finnish national normative test battery (Lindeman, 1998) and translated into Estonian (for more information, see Soodla et al. 2015).

Reading fluency. In this two-minute speeded test, the students were asked to match a picture to a corresponding word from four phonologically similar words. The sum score of correctly matched items was used (maximum score = 80). Test–retest reliability was .78 in the Estonian data and .67 in the Finnish data, respectively. In Finland, students who cannot read at school entry improve more in their reading fluency during the first grade than others and this heterogeneity among students' entry-level skills is likely to explain the lower reliability for the test–retest measure in the Finnish sample (Lerkkanen, Ahonen, & Poikkeus, 2011).

Reading comprehension. The reading comprehension test consisted of an expository text and a total of 12 comprehension questions. There were 11 multiple choice questions with four alternative answers for each question and one question that required the students to order the informational units according to the text. The sum of the correct responses (maximum score = 12) was used. Cronbach's alphas were .88 in the Estonian data and .78 in the Finnish data.

Data Analyses

We first examined the implementation of literacy instruction activities in Estonian and Finnish first grade classrooms. As it was not expected that all content areas would occur in every classroom, we recoded each lesson as either including or not including the specific content. We then ran chi-square tests of independence for the associations between country and instructional activities. Further comparisons of the durations of the instructional activities in each country were run for those activities that were observed in almost all (i.e., over 90% of the classrooms) or all classrooms. Because of the small number of Literacy lessons and deviations from the normal distribution in instructional activities, non-parametric Mann–Whitney U tests were used in the analyses. The probability-based effect size measure *A* was used for the Mann-Whitney U tests for its documented suitability for non-parametric tests (Ruscio, 2008). The *A* value ranges from .5 (lowest probability) to 1.0 (highest probability) for the probability of a randomly chosen member from Group 1 (in this study Estonia) to score higher than a randomly chosen member from Group 2 (in this study Finland).

Second, multilevel modelling techniques (Muthén 1997) were applied to analyse the associations between the CF and MF activities and country with students' reading fluency and reading comprehension. In the analyses, classroom was used as a clustering variable.

Intraclass correlations (ICC; Heck, 2001; Muthén, 1991) were calculated to determine the proportion of variance in students' reading fluency and reading comprehension that was attributable to the classes in both Estonia and Finland. In addition, correlations among study variables at within and between levels were computed. Second, two random coefficient multilevel regression models (Muthén & Muthén, 1998–2015) were constructed to investigate the extent to which differences existed between Estonian and Finnish classrooms' associations between the content of activities (CF or MF) and students' reading performance (reading fluency and comprehension) in first grade spring. Furthermore, we examined the

impact of entry-level reading performance in first grade autumn on these associations. Analyses were conducted separately for CF and MF activities.

In the multilevel models (see Figure 1), variances in the reading performance variables in first grade spring were differentiated into two components: variations that were due to similarities among students in the same classroom (between-class level variation) and variations that were due to students' differences within the classrooms (within-class level variation). Other variables were treated as either between- or within-level variables as follows. At the student (within) level, the level of students' reading fluency and reading comprehension in first grade spring were predicted by students' entry-level reading fluency in first grade autumn while adjusting for parents' level of education. The level of reading fluency and comprehension in first grade spring were allowed to vary randomly across classrooms (L_1 and L_2 in Figure 1). Similarly, the strengths of the associations (i.e. slopes) of entry-level reading fluency in first grade autumn on reading fluency and comprehension in first grade spring (S_1 and S_2 in Figure 1) were allowed to vary randomly across the classrooms. These random levels and slopes are denoted in Figure 1 by black dots at the within level and as larger circles denoting latent variables at the between level. Then, the aforementioned random variations in the levels and slopes were modelled at the classroom (between) level by four continuous latent variables (Muthén & Muthén, 1998–2015). These latent variables were predicted by the content of activities (either CF or MF), country, and their interaction.

[Figure 1 near here]

Multilevel analyses were performed using the Mplus statistical software (version 7.4; Muthén & Muthén, 1998–2015). As the variables were skewed, the parameters of the models were estimated using maximum likelihood estimation with non-normality robust standard errors maximum likelihood robust (MLR). The Full-Information-Maximum-Likelihood

(FIML) procedure was used to account for missing data (Enders, 2010). This method uses all available data to estimate the model without imputing data.

Results

Implementation of Instructional Activities

The descriptive statistics of the study variables are shown in Table 1.

[Table 1 near here]

Instructional contents varied between the lessons as the content reflected the topics of the Literacy lessons. In every classroom, some non-instructional activities (M = 26.13%, SD = 9.05%) and a large proportion of MF activities (M = 54.72%, SD = 19.62%) were observed. CF activities were observed in 30 out of the 33 (90.91%) classrooms, and their proportion was smaller than that of MF activities (M = 22.10%, SD = 15.64%). No statistically significant differences were found in the extent of CF (p = 0.096) or MF (p = 0.122) activities between Estonian and Finnish classrooms at the composite level. Certain predominant MF activities, especially *listening and reading comprehension* and *text reading and listening*, were observed in all or nearly all classrooms, whereas the range of different CF activities used by the teachers was larger.

Even though students' vocabulary was supported in some form in most of the classrooms, it was supported more often in printed form in Estonian classrooms than in Finnish classrooms ($\chi^2(1) = 9.17$, p = .002, r = .53). The durations of text reading and listening as well as listening and reading comprehension activities, which were observed in all but one classroom, were compared between countries. A statistically significant difference between countries was found for *listening and reading comprehension* (U = 54.00, p = .014, A = .77), which was observed more in Estonia than in Finland. *Individualised work* was observed solely in Finland ($\chi^2(1) = 10.31$, p = .001, r = .56) in 5 out of 12 classrooms.

The Associations between Students' Reading Performance and Instructional Activities

The results of the ICC for reading fluency and reading comprehension showed that differences between classrooms were statistically significant and explained 9% to 17% of the total variance in the total sample (Table 2). However, further analyses showed that differences between classrooms were significant only in Estonia whereas in Finland differences between classrooms were negligible. Students' reading fluency and reading comprehension showed moderate to strong correlations at within level and, in Estonia, also at between level. In Finland, a strong correlation was found especially between the amount of CF activities in the observed Literacy lessons, and students' reading fluency in first grade spring.

[Table 2 near here]

Next, the relationships between the content of instruction, country, and entry-level reading fluency on students' level of reading fluency and reading comprehension in first grade spring were investigated. Separate analyses for CF and MF activities were conducted. At the within-level, students' reading fluency and reading comprehension were statistically significantly associated with each other (CF: unstandardized estimate = 2.04, p = .001; MF: unstandardized estimate = 1.98, p = .001). The estimates and standard errors of the estimates at the between-level are presented in Table 3. The results related to the level of reading fluency (L_1 in Figure 1) and the strength of the association from entry-level reading fluency to reading fluency in first grade spring (S_1 in Figure 1) are presented next, followed by the results related to the level of reading comprehension (L_2 in Figure 1) and the strength of the association from entry-level reading fluency to reading comprehension in first grade spring (S_2 in Figure 1).

[Table 3 near here]

Interactions between the content (CF or MF) of instruction and country were associated with the level of reading fluency (Table 3). In both models, Finnish students' levels of reading fluency were somewhat higher than their Estonian peers. In Estonia, the amount of CF or MF instruction was not associated with the students' level of reading fluency (for CF: $z = -1.21$, $p = 0.227$; for MF: $z = 0.73$, $p = 0.466$). In the Finnish sample the amount of both CF ($z = 5.08$, $p < .001$; Figure 2) and MF ($z = -2.89$, $p = 0.004$) activities was associated with the students' level of reading fluency: high amount of CF activities and low amount of MF activities were associated with higher level of reading fluency among the students. In addition, the level of reading fluency differed in Estonia and Finland when a high amount of CF activities ($z = 43.94$, $p < .001$; Figure 2), a low amount of MF activities ($z = 5.09$, $p < .001$) and a high amount of MF activities ($z = 1.98$, $p = 0.048$) were observed.

[Figure 2 near here]

Neither the content of instruction, country, nor their interaction predicted the random slope of reading fluency in first grade spring (Table 3). That is, the strength of the association between entry-level reading fluency and reading fluency in the spring of first grade was similar in the Estonian and Finnish classrooms regardless of the amount of CF or MF activities.

Both interactions between the content of instruction (CF or MF) and country only predicted the random slope of reading comprehension in first grade spring (S_2; Table 3). That is, the strength of the association between entry-level reading fluency and reading comprehension at the end of first grade differed in the Estonian and Finnish classrooms, according to the amount of certain literacy instruction content. This was found for both CF and MF.

Further analyses for CF showed that the amount of CF activities did not have different effects on the reading comprehension of Estonian students with different reading fluency

levels in the beginning of the school year or on Finnish students who had high reading fluency levels at the beginning of first grade (Figure 3). Instead, their reading comprehension was at the level with their autumn reading fluency. In contrast, for Finnish students whose reading fluency was one standard deviation below the mean in first grade autumn, the amount of CF activities seemed to matter. Their slope S_2 differed statistically significantly from that of Estonian beginning readers (slope difference: $z = 3.06$, $p = 0.002$), as well as from the more advanced readers in Estonia ($z = 2.85$, $p = 0.005$). Based on the slopes, the Finnish beginning readers tended to have better reading comprehension if they were exposed to high rather than low amounts of CF activities.

[Figure 3 near here]

Similar results were found in the MF model as in the CF model. Only the S_2 of Finnish beginning readers differed statistically significantly from other groups: the slope difference between Finnish and Estonian beginning readers was $z = -2.33$ ($p = 0.020$), between Finnish beginning readers and more advanced readers in Estonia $z = -3.40$ ($p = 0.001$), and between Finnish beginning readers and Finnish more advanced readers $z = 1.99$ ($p = 0.047$), respectively. Based on the slopes, the Finnish beginning readers' reading comprehension tended to be poor if they were exposed to a high amount of MF activities.

Discussion

The aim of the present study was to investigate literacy instruction in Estonian and Finnish first grade classrooms by the ISI observation coding system, and to examine associations between literacy instruction and reading performance among Estonian and Finnish students. We found more similarities than differences in literacy instruction between Estonia and Finland, but the analyses of the associations with students' reading performance revealed some country-specific interaction effects. These findings suggest that both

differences in students' entry-level reading skills and in teachers' predominant emphases may be relevant in determining the amount of CF and MF activities that would provide an optimal balance for the group and phase of literacy learning.

First, we investigated how literacy instruction was implemented in Estonian and Finnish classrooms. Our findings supported the hypothesis (Soodla et al., 2015) that in contrast to Finnish teachers, Estonian teachers spend more classroom time on listening and reading comprehension activities. Furthermore, we expected to observe more individualising activities in Finland as Finnish students pre-literacy skills vary more, but surprisingly individualising practices when teaching basic literacy skills were found only in Finland. This pattern of findings appears to reflect teachers' adapting their instructional strategies to the different phases of students' formal literacy learning careers. As almost all of the Estonian students were able to decode words upon entering school, in Estonian first grade classrooms, the emphasis on comprehension was stronger than in Finnish classrooms. In Finland, teachers tended to engage more often in individualising literacy contents based on students' reading skills. Smaller class sizes and presence of a qualified teacher in the Finnish classrooms, in comparison to Estonian bigger class sizes and some teachers without a master's degree, may have contributed to the finding that individualised activities were observed only in Finland. Furthermore, there are some differences in curriculum, teaching material and contents in teacher training which may also link to the different findings of instructional activities (Kikas & Lerkkanen, 2011).

Second, we examined the associations between instructional activities and students' reading fluency and comprehension. Our hypotheses of the associations were only partially confirmed. The amount of either CF or MF activities did not associate with the level of reading fluency or comprehension among Estonian students nor had any additional effect on students' first grade spring performance when students' entry-level reading fluency was taken

into account. The results for Finnish students were more in line with our hypotheses and the earlier findings of Connor et al. (e.g., 2007, 2009), as a high amount of CF activities was associated with higher levels of reading fluency. In addition, the amount of time spent in CF activities was also positively associated with better reading comprehension results among students with low entry-level reading fluency.

One possible explanation for the discrepancies between the countries in these results is likely due to the differences in the onset of reading instruction and, hence, the students' entry-level reading skills. In contrast to Finnish first graders, Estonian first graders' low reading fluency at the beginning of first grade may be a stronger sign of a more persistent deficiency in reading fluency and not just a natural manifestation of variations in children's rates of early literacy development (Torppa et al., 2019). We expected Estonian slow readers to show better performance when higher amount of CF activities was observed based on earlier findings of the need for a longer period of time for CF activities among lower performing students (e.g. Connor et al., 2013), but this was not verified in our study, and this kind of support was not provided by differentiating the literacy contents based on students' skill levels. It is possible that a lot of time spent on reading comprehension activities might have been too demanding for some of the Estonian students and hindered their further development. This may be linked to the worrying findings of low performing Estonian students lagging behind in their skill development (Torppa et al., 2019)

In Finland, the development of reading fluency among students who do not read before entering school is very rapid during the first few months of formal education in first grade autumn (Lerkkanen et al., 2004). As the assessment of reading fluency at the beginning of first grade provides a less stable estimate of Finnish students' skills than those of Estonian students (Torppa et al., 2019), more time spent on activities that supported the development of CF skills seemed to support the development of students' reading fluency in general, and it

also appeared to be associated with the reading comprehension of the lowest performing beginning readers. In addition, the somewhat higher incidence of individualised activities in Finland suggests that teachers may be more likely to take students' different skill levels into account when implementing literacy activities. Finnish teachers reported that they provide more individualised support to students with poorer skills (Kiuru et al., 2015), and this may take place with tasks of different levels of difficulty.

Limitations

This study has limitations, which should be taken into account. First, the analyses were based on the literacy instruction activities of one lesson in each classroom. As teacher choices of contents are likely to differ somewhat from lesson to lesson the observation cannot reflect the whole spectrum of literacy instruction activities in Estonian and Finnish classrooms. However, as the analyses were conducted on the level of summative categories of CF and MF, we expect that the observed differences between classrooms, especially at country level, are characteristic of typical instructional practices in these countries. Second, the current analyses were based on audio-recorded data, which does not give complete information about the instructional activities provided to students. Third, owing to the small sample size our study may have suffered from limited statistical power. This may have resulted in an inability to detect some of the more subtle interconnections between country, content of instruction, and reading performance. Also, it should be noted that the results relating to the interconnections between content, country, and reading performance do not imply causal relationships as they were mostly measured within the same time point.

Conclusion

Overall, students' spent more time on MF activities than on CF activities on first grade spring. Yet, CF activities are important as there is variation in students' reading performance and there are still students who are learning to decode in first grade spring and, hence, need support to consolidate these skills. These results highlight that in the early years of literacy instruction, students need ample support and exposure to literacy content and instruction adapted to their skill level. This is especially important for readers with low fluency skills who, thus, need more support on coding skills.

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