

**This is a self-archived version of an original article. This version may differ from the original in pagination and typographic details.**

**Author(s):** Ruotsalainen, Jenni; Pakarinen, Eija; Poikkeus, Anna-Maija; Lerkkanen, Marja-Kristiina

**Title:** Literacy instruction in first grade : classroom-level associations between reading skills and literacy instruction activities

**Year:** 2022

**Version:** Published version

**Copyright:** © 2022 The Authors. Journal of Research in Reading published by John Wiley & So

**Rights:** CC BY 4.0

**Rights url:** <https://creativecommons.org/licenses/by/4.0/>

**Please cite the original version:**

Ruotsalainen, J., Pakarinen, E., Poikkeus, A., & Lerkkanen, M. (2022). Literacy instruction in first grade : classroom-level associations between reading skills and literacy instruction activities. *Journal of Research in Reading*, 45(1), 83-99. <https://doi.org/10.1111/1467-9817.12384>

# Literacy instruction in first grade: classroom-level associations between reading skills and literacy instruction activities

Jenni Ruotsalainen 

Department of Teacher Education, University of Jyväskylä, Jyväskylä, Finland

Eija Pakarinen 

Department of Teacher Education, University of Jyväskylä, Jyväskylä, Finland

Anna-Maija Poikkeus 

Department of Teacher Education, University of Jyväskylä, Jyväskylä, Finland

Marja-Kristiina Lerkkanen 

Department of Teacher Education, University of Jyväskylä, Jyväskylä, Finland and  
Norwegian Centre for Learning Environment and Behavioural Research in  
Education, University of Stavanger, Stavanger, Norway

**Background:** Adapting instruction to individual students' needs is known to be effective, but there is a lack of evidence whether students' reading skills are associated with literacy instruction activities at classroom-level. Both the content of the literacy instruction and teachers' instructional support through instructional management are considered.

**Methods:** The data were collected in the context of Finland where first graders' reading skills show great variation at school entry but rapid progress. Students ( $n = 616$ ) were individually tested on their reading skills, and literacy lessons in 35 classrooms were video recorded in the autumn of first grade. Multilevel path analyses were conducted to examine the classroom-level associations between reading skills (accuracy and fluency) and three types of literacy instruction activities (coded from the video recordings). The number of students present and the teachers' work experience were controlled in the analyses.

**Results:** The results indicated that, at classroom-level, lower average reading skills were associated with more lesson time allocated to code-focused activities such as decoding and spelling tasks in which instructional management was directed for the whole group. In turn, higher average reading skills in classrooms were associated with more lesson time allocated to individual or small group assignments. The reading skills were not associated with meaning-focused activities such as text-level reading activities and class discussions with the whole group.

**Conclusions:** In early literacy lessons, students' reading skills were associated with teachers' implementation of different literacy instruction activities at classroom-level. In classrooms with more students having already acquired basic decoding skills, teachers provided more classroom time for independent practice and individual support, which is likely to support consolidation of students' literacy skills.

**Keywords:** literacy instruction, reading accuracy, reading fluency, first grade

## Highlights

*What is already known about this topic*

- Students' reading skills vary greatly at the entry to primary school.
- Adapting both the content and amount of instructional support based on a student's skills has been shown to be effective, but the knowledge of these processes is limited into studying adaptations at the level of the individual student or specific learning situations. However, the students' skills at classroom-level may also affect the instruction.
- In order to support students' reading skills development, both the content of the instruction and adequate support for learning are important.

*What this paper adds*

- This study is among the first to analyse classroom-level associations between students' reading skills and literacy instruction activities in the lesson.
- Students learning to read have been shown to benefit from code-focused activities with teacher support, whereas more advanced students have been shown to benefit from independently practicing their skills. This study showed that teachers typically engaged their students in whole group instruction on accurate decoding and spelling when the students reading skills were lower at classroom-level (i.e. there were more students learning to read), whereas higher reading skills (i.e. more students that were able to read) were associated with more time spent in independent practicing.
- Higher skills of students in a classroom (i.e. more students that are able to read) may invite and offer more opportunities for the teacher to adapt instruction at the level of the individual student.

*Implications for theory, policy or practice*

- Teachers should sensitively observe the skills development of their students and adapt their instruction based on this information.
- Teachers' continued professional development on adapting literacy instruction activities and flexible planning of lessons according to their students' skills should be supported.

The wide variation in children's literacy skills at school entry places high demands on teachers for practices of individualisation across various skill levels. Adapting instruction based on learners' different needs is not a new concept, although a range of terms has been used to describe it (for a review, refer to Parsons et al., 2018). Also not new is the notion that these adaptations are challenged by the complexities of the classroom context, which entails teachers simultaneously interacting with a diverse group of students (e.g. Corno, 2008). Instructional adaptations can take place at multiple levels from fine-tuned micro-level adaptations such as differentiation of tasks or providing further examples during instructional situations to macro-level adaptations, such as specific programmes based on learners' skills (Corno, 2008).

Notwithstanding macro-level adaptations (Corno, 2008), the term 'adapting instruction' is typically used to imply teachers responding to individual students' learning needs during instruction (e.g. Hardy, Decristan, & Klieme, 2019; Parsons et al., 2018). Less is known about whether the students' skills at classroom-level are associated with the teacher's instructional practices (as exceptions, refer to Kikas, Pakarinen, Soodla, Peets, & Lerkkanen, 2017; Pakarinen, Lerkkanen, Poikkeus, Siekkinen, & Nurmi, 2011), and, to our knowledge, this understanding is lacking with respect to early literacy instruction. In this study, we will examine the classroom-level associations between reading skills and teachers allocation of instructional time on different types of literacy activities, for example activities focusing on decoding of syllables or words versus text-level reading and comprehension tasks, in Finnish classrooms in the autumn of first grade when formal reading instruction has just begun. To analyse teachers' literacy instruction activities, the Individualising Student Instruction (ISI) observation system (Connor et al., 2009; Connor & Morrison, 2016) was used to examine both the content of the activities and the instructional support through instructional management that teachers provided for their students in the classrooms. Thus, the present study seeks to throw light on the potential role of students' skills at classroom-level on first grade literacy instruction by a detailed analysis of video recordings of the literacy instruction activities, not the process of adaptation itself.

### **Literacy instruction and its adaptation to students' skill development in early grades**

Adapting instruction based on learners' needs is interactive in nature and involves reciprocity in cyclical adjustments of teachers' practices with students' responses and characteristics. Even though Bronfenbrenner's bioecological model of human development (Bronfenbrenner & Morris, 2006) did not take a stance on instruction per se, its consideration of transactions in different contexts across time and especially the role of proximal processes as the main driver of development depict many important aspects of instruction as well. Jaeger (2016) and Connor et al. (2009, refer also to Day et al., 2015) have provided examples of how the bioecological model of human development (Bronfenbrenner & Morris, 2006) can be applied to studying and understanding classroom instruction. An important aspect in instruction is acknowledging the child's active role in learning situations. As Jaeger (2016) noted, the teacher does not just affect students' learning but is also affected by the students (refer also to Day et al., 2015).

Jaeger (2016) argued that teaching entails flexible planning and 'remaining tuned to the child's response to text/activity and revising the plan as needed' (p. 177), rather than striving for perfect unchangeable lessons. Thus, the teacher's knowledge of the students' diverse needs in the classroom should optimally be reflected in the overall design and

practices of the lesson with in situ modifications during the lessons. This was reflected in Hardy et al.'s (2019) division into intended and implemented adaptations. Intended adaptations refer to teachers' instructional planning and actions based on their knowledge of individual students' needs, whereas implemented adaptations refer to teachers' adaptations while teaching, such as questioning and prompting when a learner faces difficulties (cf. micro adaptations, Corno, 2008).

A major claim for adapting instruction is that it contributes to student learning (e.g. Connor et al., 2013; Juel & Minden-Cupp, 2000; Pressley et al., 2001). Instruction that supports young students' reading and spelling acquisition is crucial in order to achieve the ultimate goal of providing independent access to texts for the students. Effective decoding and spelling instruction includes explicit skills instruction, such as the systematic use of phonics, paying attention to sublexical parts within words and demonstrating the relationship between graphemes and phonemes (e.g. Connor, Morrison, & Katch, 2004; de Graaff, Bosman, Hasselman, & Verhoeven, 2009; Lerkkanen, 2007). Differences in orthographies, however, have been shown to affect the instructional strategies of early literacy instruction as well as the pace of skills development (e.g. Seymour, Aro, & Erskine, 2003).

In implementing decoding and spelling instruction, the teacher needs information on the students' prerequisite skills, for example phonological awareness and letter knowledge, and decoding and spelling at the syllable and word levels, in order to be able to adapt instruction accordingly. To keep pace with the increased complexity of the proximal processes which support a child's growing skills by age (e.g. Jaeger, 2016), the foci and level of literacy instruction should change over time. There is evidence, which indicates that practicing grapheme-phoneme correspondence and word-level reading and spelling after the student has acquired a sufficient level of accuracy has not proven to provide any further advancement for reading skills development (e.g., Connor et al., 2004; Lerkkanen et al., 2016). Rather, in concert with the student's growing skills, the emphasis should shift from mainly code-focused (CF) instruction to practicing meaning-focused (MF) skills such as reading of texts, comprehension and productive skills. Access to texts and explicit practicing of comprehension skills, however, have been shown to be important for beginning readers as well to advance their listening and reading comprehension skills (Lepola, Lynch, Kiuru, Laakkonen, & Niemi, 2016; Lerkkanen, Rasku-Puttonen, Aunola, & Nurmi, 2004). Practicing of comprehension has been shown to be most beneficial for beginning readers when it was practiced together with the teacher (Connor et al., 2004).

While it is important to match the content of literacy instruction to a student's current skill, it is also important to adapt the type of instructional support. A wide consensus attests that teacher's instructional support should be stronger when a student is learning a new skill or is facing difficulties, but support needs to be phased out in a timely fashion to strengthen student autonomy and ownership of learning (e.g. Corno, 2008; Pressley et al., 2001; van de Pol, Volman, & Beishuizen, 2010). For example, the studies by Connor et al. (2004, 2013) combining content of the instruction with instructional management have shown that after students master the basics of decoding, instructional practices ought to shift more towards autonomous practicing of the skills. The teacher can then afford higher autonomy to those students who are further along on their literacy learning paths and provide tailored support to those who need to consolidate the basic skills (Corno, 2008; Kiuru et al., 2015; Virinkoski, Eklund, Lerkkanen, Holopainen, & Aro, 2021).

### **Literacy instruction in Finland**

Finnish students enter the first grade of comprehensive school in the year they turn 7 years of age. By that time, their development in phonological awareness and letter knowledge skills have been supported in pre-primary education, but the children do not receive formal instruction for decoding and spelling before first grade (Finnish National Agency for Education, 2016). Despite this relatively late onset of formal reading instruction, a recent nationwide study among school beginners (Ukkola & Metsämuuronen, 2019) documented that more than half of the students were able to decode at least simple single words at school entry, and only a third of the students did not yet have full mastery of grapheme-phoneme correspondence. Due to the transparent orthography of the Finnish language and systematic phonics-based instruction, reading acquisition takes place in a rapid fashion, and nearly all children are accurate and rather fluent decoders at the end of their first year of formal reading instruction (Holopainen, Koch, Hakkarainen, & Kofler, 2020; Lerkkanen et al., 2004).

Even though the variations in literacy skills among Finnish school beginners are wide, the differences between classrooms are small (Ukkola & Metsämuuronen, 2019). A likely reason for this is the non-selective practice of Finnish comprehensive schools due to which nearly all students are enrolled in their nearest publicly funded school (Linnakylä, Välijärvi, & Arffman, 2007). The national core curriculum (Finnish National Agency for Education, 2016) outlines the broad content and age-specific goals for literacy instruction, but teachers are given high autonomy in planning and implementing their instructional practices, including how they allocate their time for teaching different literacy contents in literacy lessons (seven lessons per week in first grade). With respect to decoding and spelling instruction, phonics-based practices are widely used to progress from letter-sound correspondence to syllable and word levels of reading (Lerkkanen, 2007), and these practices are also supported by the ABC books and related study materials. In the early grades, some literacy lessons are often taught to half of the students in a classroom to allow for smaller class size. In addition, flexible groupings during activities are widely used.

The teachers are expected to carefully monitor students' development and individualise their instruction based on their students' needs (Finnish National Agency for Education, 2016; Linnakylä et al., 2007). With respect to students facing difficulties, teachers collaborate with the special needs teacher in both the assessment and provision of support (Virinkoski, Lerkkanen, Eklund, Holopainen, & Aro, 2017). Self-reports by teachers have indicated that teachers are sensitive to their students' skill levels, and they tend to adapt their instruction to provide more individual support to children with poor reading skills (Kiuru et al., 2015; Nurmi et al., 2013). Although a recommendation for adapting instruction to students' skills is stated in the national curriculum guidelines (Finnish National Agency for Education, 2016), research evidence on its implementation in the instruction of first grade students' classrooms is not yet available.

### **Aim of the study**

The aim of the present study was to examine classroom-level associations between students' reading skills and teachers' allocation of instructional time to different types of literacy instruction activities in observed literacy lessons at the beginning of first grade.

In line with Connor et al. (2009) and Connor and Morrison (2016), both instructional management and the content of instruction were included into the analysis of literacy instruction activities. The following three research questions were set in the study:

- 1 To what extent do teachers provide support through instructional management for the whole group or for students working independently?
- 2 To what extent do teachers implement CF and MF contents during their literacy lessons?
- 3 Are the students reading skills associated with the extent of different types of literacy instruction activities during the lesson? To our knowledge, direct research evidence on these associations at classroom-level is lacking in regular classrooms. Thus, hypotheses were not set.

## Method

### *Participants and procedure*

The data for the present study were drawn from the Teacher and Student Stress and Interaction in Classroom study (Lerikkanen & Pakarinen, 2021). Before commencing the study, the ethical committee of the university granted ethical approval for the study. The present data comprise individual assessments of 616 students (51.8% boys;  $M = 7.19$  years,  $SD = 0.34$  years) from a total of 35 first grade classrooms in 21 schools and video-recorded literacy lessons from these same classrooms in the autumn of 2017. The mean class size in the sample was 19.89 ( $SD = 3.79$ ) – reflecting the typical class size of Finnish first grade classrooms. The majority of the video-recorded literacy lessons (26 out of 35) were regular 45-minute lessons ( $M = 39$  minutes & 20 seconds,  $SD = 10$  minutes & 59 seconds). Six of the lessons lasted less than 30 minutes (minimum of 24 minutes), which was usually due to the lunch schedule, and three of the lessons lasted 90 minutes. In five cases, more than one video-recorded literacy lesson was available in the classroom. In these cases, only one lesson was included in the analyses by applying the following selection criteria: (1) a 45-minute lesson was prioritised over shorter or longer lessons ( $n = 2$ ), and (2) the first of the literacy lessons ( $n = 3$ ) from the classroom was selected for the analysis. In the latter case, the classroom had been divided into two groups, both of which received the same instruction by the class teacher during different lessons (one in the morning and one in the afternoon).

Both the students' individual reading skills assessments and the video recordings in the classrooms took place during the autumn term (between September and December) 2017 of first grade. Skill assessments and video recordings were carried out in each classroom within a two- to three-week time period ( $M = 12.66$  days,  $SD = 8.45$  days). A questionnaire was completed by teachers providing information on their educational backgrounds and work experience. The vast majority of the teachers (32 out of 35) were female. All teachers had a master's degree in education. The teaching experience of the teachers participating in the study ranged from 6 months to 39 years ( $M = 15.74$  years,  $SD = 9.75$  years). The teachers and the students' parents on behalf of their child provided written consent to take part in the study. Using a questionnaire, the parents reported their educational levels: 2% had completed the 9-year compulsory education, 35% had completed secondary education, 34% had either a bachelor's degree or a vocational college degree and 29% had completed a master's degree or higher. The educational level of the parents was somewhat higher than



that of the general population in Central Finland (Official Statistics of Finland, 2018), which ranged from low to high – 8%, 47%, 24% and 21%, respectively. The information on parental education was missing for 37% of the families participating in the study.

### *Measures*

*Reading skills.* Students were assessed individually on their reading accuracy and reading fluency with two nationally widely used reading tests. The *reading accuracy* test (Lerkkanen, Poikkeus, & Ketonen, 2006) comprised a 20-item word list of two- to five-syllable words of increasing difficulty in terms of their length and familiarity. There was no time limit for the test, but it was discontinued if the student did not provide a response or gave an incorrect response for three consecutive test items. Students were awarded one point for each correctly read word (maximum 20 points). In the *reading fluency* test (Häyrinen, Serenius-Sirve, & Korkman, 1999), the students' task was to read aloud words from the word list (maximum of 90 words) within a 45-second time limit. The student was awarded one point for each correctly read word (maximum score of 90 points). The reading accuracy measure allows also the beginning readers to show their ability to decode separate words, whereas the reading fluency measure shows more of the individual variation of the speed in word recognition. The correlation between the two measures was .731 ( $p < .001$ ). For the analyses, a composite (mean) score for reading skill was calculated based on the standardised test scores of reading accuracy and reading fluency using equal weights for these two tests. Cronbach's alpha for the composite reading skill was .85.

*Individualising Student Instruction in literacy lessons.* The guidelines of the ISI (Pathways) observation system (Connor et al., 2010) and its manual adapted to the Finnish language context (Poikkeus, Lerkkanen, Ruotsalainen, & Soodla, 2013) were applied for coding of literacy activities in the video-recorded lessons. The original ISI coding manual (refer to Connor et al., 2009, 2010) had been developed to analyse instruction received by individual focal students in a classroom situation; however, in the present study (and in a previous study by Ruotsalainen et al., 2022), the focus was on coding the instruction the teachers provided for all students in their classrooms attending the specific lesson. In the ISI coding system, literacy instruction is analysed along three dimensions: *context*, *instructional management* and *content*. In the present study, information of context was integrated into codes of management. Analyses are reported as combined codes reflecting the types of instructional support the teachers provided to the students.

Coding of the dimension of *instructional management*, focused on determining the locus of responsibility for directing the students' attention in the task at hand. Activities with a teacher lead (e.g. read aloud session and explicit instruction on decoding for the whole group) were coded as teacher/child-managed (TCM). Learning situations in which the majority or all of the students managed their work without the teacher's support were coded as child-managed (CM). As we conducted the coding at the classroom-level rather than at the level of individual students, the dimension of management integrated information of the *context* (whole group, small group and individual). TCM was coded when the teacher directed the instruction to all students who were present in the lesson (for whole group), whereas CM was applied for independent small group and individual work.



With respect to *content*, language-specific features of Finnish were taken into account when adapting the coding scheme from literacy instruction in the English language context (Poikkeus et al., 2013). For example, activities focusing on onset and rime (included as a subcode in the original manual; Connor et al., 2010) are not effective methods for decoding instruction in the Finnish language context because of its very transparent (almost perfect) one-to-one grapheme-phoneme correspondence (Aro, 2006). Rhyming is, however, widely used in early-stage literacy instruction in both the English and Finnish contexts to foster phonological sensitivity in the early preschool years (refer to Goswami, 1999; Silvén, Poskiparta, Niemi, & Voeten, 2007). Words in the Finnish language are typically long because of their agglutinative morphology and rich derivational system, and monosyllabic words are fewer than in many other languages (refer to e.g. Aro, 2006). Thus, many early decoding and spelling activities in the early phases utilise syllables, which are perceptually salient units of the spoken language. Students are typically first taught to decode syllables (blending of syllables with two or three graphemes and their corresponding phonemes) before proceeding to decoding multisyllabic words (Lerikkanen, 2007). In spelling exercises, the teacher might say aloud the whole word, then repeat the first syllable and ask the students to write down the syllable. In the adaptation of the Finnish ISI manual, this emphasis on early decoding and spelling instruction utilising syllables led to the addition of some subcodes.

In the coding process, each activity lasting at least 10 seconds was first coded with respect to both the management of attention in the activities and the content of literacy instruction. In the original ISI/Pathways manual (Connor et al., 2010), the minimum duration was 15 seconds, but a 10-second criterion was considered better suited to the Finnish context (Poikkeus et al., 2013). *Content* of literacy instruction was coded using 10 codes. These codes represented activities with a focus on decoding, reading fluency, comprehension from text, or oral language exercises, for instance. The codes were categorised under the broader categories of CF and MF activities. Table 1 provides more detailed description

**Table 1.** Codes for instructional management type and content of instruction (Poikkeus et al., 2013).

Codes for instructional management of instruction <sup>a</sup>	Codes for content of instruction
1. Teacher/child-managed (TCM) activities: Teacher and students managed students' attention to the task together 2. Child-managed (CM) activities: The majority of the students managed their work independently or with peers, but the teacher provided support to one student or a small group of students at a time	1. Code-focused activities (CF) <ul style="list-style-type: none"> <li>• Phonological awareness</li> <li>• Grapheme-phoneme correspondence</li> <li>• Decoding (syllables and words)</li> <li>• Spelling (syllables and words)</li> <li>• Fluency</li> </ul> 2. Meaning-focused activities (MF) <ul style="list-style-type: none"> <li>• Oral vocabulary activities, e.g. class discussions to promote vocabulary development and sharing experiences</li> <li>• Print vocabulary activities</li> <li>• Text reading and listening</li> <li>• Listening and reading comprehension</li> <li>• Writing on a sentence or text level</li> </ul>

<sup>a</sup>TCM activities by definition concern instruction directed to the whole group, whereas CM activities are coded in the whole group setting, but they involve students' independent or small group work.

of the two codes used to code management (TCM and CM) and the 10 codes used to code content (CF and MF activities) from video-recorded literacy lessons.

For the analyses, three combination categories of management and content were formed out of the initial codings.

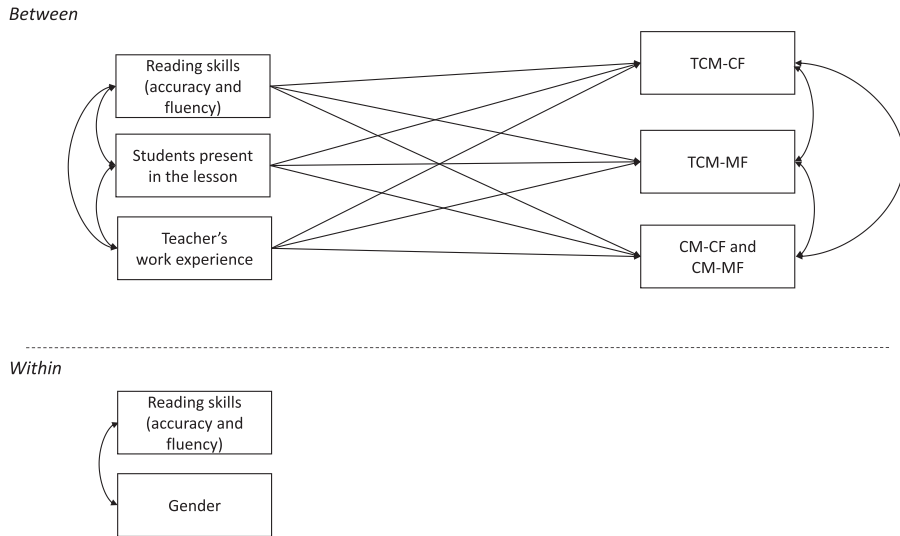
- 1 TCM-CF: whole group instruction consisting of CF reading and writing activities at grapheme-phoneme, syllable or word level. TCM-CF activities were observed in all but one classroom (in 34 out of 35)
- 2 TCM-MF: whole group instruction consisting of MF reading and writing activities at sentence or larger text level, or activities that supported students' vocabulary development, such as story reading and class discussions. TCM-MF activities were observed in 28 classrooms out of 35.
- 3 CM-CF/MF: combined code for any small group activity or independent work (i.e., combining CF and MF activities). CM-CF activities were observed in 27 classrooms out of 35. CM-MF activities were observed in five of the classrooms in which CM-CF activities were also observed, and typically, these were observed simultaneously with CM-CF activities as the teacher individualised the content, such as reading on a syllable/word- (CF) or sentence/text- (MF) level based on students' reading skills, or a student began to read a book independently (MF) after finishing the previous CF task.

Because the goal was to examine to what extent the teacher allocates literacy lesson time into different types of instructional activities across the total instructional time of the lesson, percentages of TCM-CF, TCM-MF and CM-CF/MF were calculated, that is total durations of the combination categories divided by total instructional time during the lesson. Instructional time was specified as time from when the teacher started the lesson to time when the teacher finished it. The number of students present during the observed literacy lessons was controlled for in the analysis. In most cases, this meant the whole classroom, whereas in three cases, only half of the classroom was present (the other half received the same lesson later that day). Instruction was considered TCM if the teacher directed the instruction to all students who were present in the lesson.

Of the lessons, 20% (seven lessons) were double coded. Intra-class correlations (ICCs) were calculated of the durations (in seconds) of different types of literacy instruction in order to determine intercoder reliability. The ICCs were .98 (95% *CI* = .90, .99) for TCM-CF, .99 (95% *CI* = .92, .99) for TCM-MF, and .99 for CM-CF/MF (95% *CI* = .95, .99) indicating excellent reliability (Hallgren, 2012).

### *Analyses*

The ICCs for reading skills (composite of accuracy and fluency) showed statistically significant differences between the classrooms, indicating that belonging to a certain classroom explained 7% ( $p = .003$ ) of the total variance in the sample. In the subsequent analyses, multilevel path analyses were conducted with Mplus (Version 7.3; Muthén & Muthén, 2012) to examine the classroom-level associations between students' reading skills and the percentages of literacy instruction of TCM-CF, TCM-MF and CM-CF/MF (between-level in Figure 1). The reading skills measured at the individual-level (within-level in Figure 1) were allowed to vary between classrooms (cf. random intercepts), but regression coefficients (slopes) were fixed. As potential structural factors impacting instruction, we controlled for both the number of students present during the



**Figure 1.** Schematic representation of the structural model. CF, code-focused; CM, child-managed; MF, meaning-focused; TCM, teacher/child-managed.

video-recorded lessons and teachers' work experience. At the within-level, students' reading skills were controlled for by gender. Nonsignificant paths were set to zero.

In the initial phase of analyses, the time of the assessment and the time of video recording were included in the model (represented as time in days between school beginning and the day of assessments/observations in the classroom). The time of the video recording was positively correlated with reading skills in the classrooms (between-level;  $r = .42$ ,  $p = .002$ ), but not with the percentages of types of literacy instruction nor with the students' reading skills measure at the within-level. In the analyses of the final model, the time of the students' reading assessment (at the within-level) and the time of the classroom video recordings (at the between-level) were omitted to reduce the number of parameters. Associations between the reading skills and the percentages of literacy instruction of TCM-CF, TCM-MF and CM-CF/MF remained similar in the final model, which did not include the time variable as in the model that did include time. The parameters of the models were estimated using the FIML estimation with non-normality robust standard errors (MLR estimator, Muthén & Muthén, 2012). The goodness-of-fit of the estimated model was evaluated using four indicators: chi-squared test, comparative fit index (CFI), root mean square error of approximation (RMSEA) and standardised root mean square residual (SRMR). Good model fit is indicated by a small, preferably nonsignificant  $\chi^2$ ,  $CFI > .95$ ,  $RMSEA < .06$  and  $SRMR < .08$  (Hu & Bentler, 1999).

### Results

The students' reading skills varied from those of non-readers to rather competent readers in terms of reading accuracy and fluency. The word reading accuracy assessment indicated that the students could read, on average 14 words but the variation was larger on within-level ( $SD_W = 7.36$ , range 0–20) than on between-level ( $SD_B = 2.90$ , range 8.15–17.42). Similarly, in the reading fluency assessment, the students read correctly 15

words, on average, within the 45-second time limit, but the variation was larger at the within-level than at the between-level ( $SD_W = 13.53$ , range 0–62;  $SD_B = 4.00$ , range 8.38–24.00).

Teachers varied in the extent to which they implemented different contents and management types. On average, TCM was observed 46.17% ( $SD = 17.79%$ ) of the instructional time and CM 30.06% ( $SD = 25.05%$ ). Nearly half ( $M = 46.86%$ ,  $SD = 17.57%$ ) of the instructional time comprised CF activities, whereas 27.48% ( $SD = 16.65%$ ) of the instructional time was spent in MF activities. In further analyses, combinations of management and content were used.

Multilevel path analyses were conducted to analyse the classroom-level associations between reading skills (composite of accuracy and fluency) and the percentages of the three types of teachers’ literacy instruction activities (TCM-CF, TCM-MF and CM-CF/MF) in the lessons. The number of students present in the video-recorded lessons and the teachers’ work experience were controlled for in the analysis. The final model fit the data well:  $\chi^2(8) = 9.69$ ,  $p = .29$ , CFI = .97, RMSEA = .02, SRMR<sub>within</sub> = .04 and SRMR<sub>between</sub> = .10: These indices, according to Hu and Bentler (1999), represent a good model fit except for SRMR<sub>between</sub>, which is somewhat higher than suggested. Descriptive statistics of the study variables and their correlations at the between-level are presented in Table 2.

The results (Figure 2) indicated that the reading skills, at classroom-level, were negatively associated with the percentage of TCM-CF activities during the lesson. This suggests that in classrooms with lower average reading skills, teachers allocated greater amount of lesson time to TCM-CF activities. On the contrary, reading skills, at classroom-level, were positively associated with the percentage of CM-CF/MF activities. This suggests that in classrooms with higher average reading skills, teachers allocated a greater amount of

**Table 2.** Descriptive statistics and correlations at the between-level.

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	2.	3.	4.	5.	6.
1. Reading skills	616	.00	.33	-.34*	.05	-.45*	-.04	.62***
2. Students present in the lesson	35	17.60	4.41		.15	.00	.36*	-.46***
3. Teacher’s work experience	34	15.74	9.75			.33*	-.18	-.15
4. TCM-CF	34	22.53%	13.17%				-.05	-.55***
5. TCM-MF	28	23.55%	13.88%					-.67***
6. CM-CF/MF	27	30.06%	25.05%					

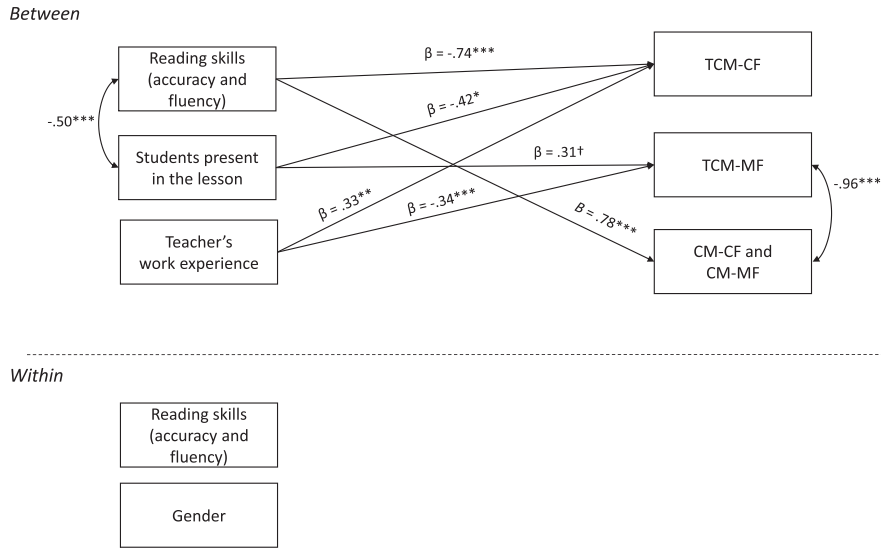
CF, code-focused; CM, child-managed; MF, meaning-focused; TCM, teacher/child-managed.

Note: Percentages indicate to a total duration of the combination category divided by total instructional time during the lesson.

\*  $p < .05$ ,

\*\*  $p < .01$ ,

\*\*\*  $p < .001$ .



**Figure 2.** Associations between students’ reading skills and types of literacy instruction activities, with number of students in the lesson and teacher’s work experience controlled for.  $^\dagger p < .10$ ,  $*p < .05$ ,  $**p < .01$ ,  $***p < .001$ . CF, code-focused; CM, child-managed; MF, meaning-focused; TCM, teacher/child-managed. Standardised estimates.

lesson time to individual or small group work. Reading skills were not associated with the percentage of lesson time teachers allocated for TCM-MF activities, but the number of students present during the lesson had a marginally significant positive association with the percentage of TCM-MF. Moreover, TCM-MF activities were used to a greater extent by less experienced teachers, whereas more experienced teachers incorporated TCM-CF activities in their instruction to a greater extent. At the level of individual students (within-level), students’ gender was not significantly associated with the students’ reading skills.

## Discussion

The present study provides novel information on the classroom-level associations between reading skills and types of literacy instruction activities observed in first grade classrooms’ literacy lessons. In this sample of 35 Finnish teachers’ lessons, nearly half of the instructional time in literacy lessons was spent in whole group TCM activities where instructional management to the tasks was done by the teacher, whereas approximately third of the time spent in literacy activities students’ attention was managed by themselves (in small groups or in individual work). Moreover, in nearly half of the instructional time, the content of the instruction was spent in CF activities (e.g. decoding and spelling). The latter finding complements previous findings (Ruotsalainen et al., 2022) from a separate sample of first grade spring where half of the literacy instruction activities were found to be MF activities. This difference in the predominant type of literacy content may be linked to the rapid reading skill development of Finnish students during the first grade (Lerikkanen et al., 2004; Soodla et al., 2015) and teachers adapting their instruction accordingly.

The results indicated that, at classroom-level, students’ reading skills were associated with the extent to which students’ attention to the tasks were managed by the teacher or

by the students themselves (managing attention via instruction at the whole group level vs. independent student work) rather than the content of the instruction. The findings indicated, on the one hand, that teachers allocated a higher percentage of CF activities, such as decoding and spelling, in a whole group with TCM of attention when they were teaching a group consisted of students with lower skills, that is many of their students were still acquiring basic skills of reading and required support to consolidate decoding. On the other hand, higher average reading skills in the classroom, that is more students having surpassed the foundation phase of reading acquisition, was associated with more classroom time spent in independent or small group practicing of both CF and MF content. It has earlier been established that the reading proficiency among those Finnish school beginners who do not yet read at school entry typically changes rapidly in the autumn term of first grade from not being able to decode any words to relatively accurate reading (Lerikkanen et al., 2004). The present classroom-level associations between reading skills and teacher instruction suggest that teachers may adapt their instruction to match the group's overall needs. However, demonstrating this assumption would require a longitudinal design.

In addition to instructional support for all students during whole group instruction, the teachers also provided first grade students with individual support and tailored individual or small group assignments, and this kind of independent work appeared also to be associated with the reading skills. Previous studies have shown that teachers report giving more support to those students who are struggling with their reading (Kikas, Silinskas, Jõgi, & Soodla, 2016; Kiuru et al., 2015; Nurmi et al., 2013). As the focus of the present study was at the classroom-level, the data did not provide information on how much instructional support for literacy learning the teachers gave to individual students. However, it has been suggested that as more students are able to work independently, teachers have more opportunities to provide instructional support specifically to students with less advanced skills (Corno, 2008; van de Pol et al., 2010). Practicing skills independently in the classroom can also give teachers valuable information on how to adapt the content of their instruction by assigning tasks at the syllable, word or text level, depending on the students' skills.

Some joint activities can support all students in the classroom (Jaeger, 2016; Lerikkanen, 2007) regardless of the students' skills, such as engaging in vocabulary-enriching MF discussions on various concepts. In the current study, this type of enrichment was seen in the use of TCM-MF activities, which were not associated with reading skills at classroom-level. Instead, our results involved a trend suggesting that TCM-MF activities would be more likely to be implemented when a higher number of students were present during the lessons. As first grade classrooms in the autumn term include students who are not yet decoding words or whose reading is still very slow, TCM-MF activities commonly comprised a story read by the teacher and listening comprehension tasks and discussions about the story. Hence, these activities provided all students with experiences of the texts and language comprehension, which are known to be important for later reading comprehension (Connor et al., 2004; Lepola et al., 2016; Lerikkanen et al., 2004). Even though this study focused on the associations between students' reading skills (accuracy and fluency) and different types of literacy instruction, listening and reading comprehension and oral language skills constitute an important domain in the early phase of literacy instruction.

The results also indicated differences in the associations between teachers' work experience and the percentages of different types of literacy instruction activities: more experienced teachers allocated more time to TCM-CF activities in their lessons, whereas less experienced teachers allocated more time to TCM-MF activities in their lessons. These

differences may reflect the increasing knowledge among younger teachers of the importance of language comprehension skills already as a part of early literacy instruction (Lepola et al., 2016; Lerkkanen et al., 2004) while acknowledging the importance of word-level decoding and spelling instruction.

### *Limitations*

This study has limitations, which need to be taken into account. Firstly, the data of the current study consist of a small number of classrooms, and only one literacy lesson per classroom was analysed. Hence, the results do not capture the whole spectrum of literacy instruction activities in these classrooms, nor whether the teachers change their instruction across the academic year. As student assessments and observational data were both collected in the autumn (approximately two weeks apart), causality cannot be inferred between them. The associations between the concurrent skills and instructional activities in the autumn of first grade are, however, drawn from a period when range of children's reading skills is wide, but changes occur rapidly in Finnish classrooms (Lerkkanen et al., 2004; Soodla et al., 2015). Secondly, measures of literacy instruction activities were based on video recordings at the classroom-level; thus, the analyses lack more detailed information of the activities and materials provided to individual students (cf. e.g. Connor et al., 2009, 2013).

The present study provided preliminary information of how skills at classroom-level may inform teachers to adapt their instruction. However, with these data we cannot directly infer what kind of adapting instruction is beneficial for the students at classroom-level and what are the effects for students with various skills. This is an important question for further studies. Future research would also benefit from combining observational methods and analyses of both classroom-level and individual students at several time points during the academic year in order to analyse associations with students' skills and to gain more understanding of the complex nature of literacy learning and teaching in the early phase of schooling.

### **Conclusions**

The present study provided insights into teachers' use of instructional activities and their associations with the students reading skills in their classrooms. In the early reading instruction, the skills of the students in a classroom may have an impact on the extent of instructional support that teachers provide to the whole group as well as to individual students. As higher proportion of students in a classroom acquires basic decoding skills, individual and small group work are likely to serve as an arena for individualising literacy content and instructional support to match each student's literacy skills development. Teachers' awareness of the means for adapting instruction based on their students' skills should be supported in order to provide instruction that is optimally adjusted to both their students skills at the classroom-level and each student's learning needs.

### **Disclosure statement**

No potential conflict of interest was reported by the authors.



## Funding

This study was funded by the Academy of Finland (317610), the Finnish Work Environment Fund, and Ella and Georg Ehrnrooth Foundation.

## Data availability statement

Research data are not shared.

## References

- Aro, M. (2006). Learning to read: The effect of orthography. In R.M. Joshi & P.G. Aaron (Eds.), *Handbook of orthography and literacy*, (pp. 531–550). Lawrence Erlbaum Associates.
- Bronfenbrenner, U. & Morris, P. (2006). The bioecological model of human development. In W. Damon & R.M. Lerner (Eds.), *Handbook of child psychology: Vol. 1. Theoretical models of human development*. (6th edn), (pp. 793–828). Wiley.
- Connor, C.M. & Morrison, F.J. (2016). Individualizing student instruction in reading: Implications for policy and practice. *Policy Insights From the Behavioral and Brain Sciences*, 3(1), 54–61. <https://doi.org/10.1177/2372732215624931>
- Connor, C.M., Morrison, F.J., Fishman, B., Crowe, E.C., Al Otaiba, S. & Schatschneider, C. (2013). A longitudinal cluster-randomized controlled study on the accumulating effects of individualized literacy instruction on students' reading from first through third grade. *Psychological Science*, 24(8), 1408–1419. <https://doi.org/10.1177/0956797612472204>
- Connor, C.M., Morrison, F.J., Fishman, B.J., Ponitz, C.C., Glasney, S., Underwood, P.S. et al. (2009). The ISI classroom observation system: Examining the literacy instruction provided to individual students. *Educational Researcher*, 38(2), 85–99. <https://doi.org/10.3102/0013189X09332373>
- Connor, C.M., Morrison, F.J. & Katch, L.E. (2004). Beyond the reading wars: Exploring the effect of child–instruction interactions on growth in early reading. *Scientific Studies of Reading*, 8(4), 305–336. [https://doi.org/10.1207/s1532799xssr0804\\_1](https://doi.org/10.1207/s1532799xssr0804_1)
- Connor, C.M., Piasta, S., Al Otaiba, S., Day, S., Morrison, F.J. & Cameron, C. (2010). Individualizing student instruction. Classroom observations coding manual. Version 40.11.02.2010. Florida State University and the Florida Center for Reading Research. University of Michigan.
- Corno, L. (2008). On teaching adaptively. *Educational Psychologist*, 43(3), 161–173. <https://doi.org/10.1080/00461520802178466>
- Day, S.L., Connor, C.M. & McClelland, M.M. (2015). Children's behavioural regulation and literacy: The impact of the first grade classroom environment. *Journal of School Psychology*, 53(5), 409–428. <https://doi.org/10.1016/j.jsp.2015.07.004>
- de Graaff, S., Bosman, A.M.T., Hasselman, F. & Verhoeven, L. (2009). Benefits of systematic phonics instruction. *Scientific Studies of Reading*, 13(4), 318–333. <https://doi.org/10.1080/10888430903001308>
- Finnish National Agency for Education (2016). *National core curriculum for basic education 2014*. Finnish National Agency for Education.
- Goswami, U. (1999). Causal connections in beginning reading: The importance of rhyme. *Journal of Research in Reading*, 22(3), 217–240. <https://doi.org/10.1111/1467-9817.00087>
- Hallgren, K.A. (2012). Computing inter-rater reliability for observational data: An overview and tutorial. *Tutorial in Quantitative Methods for Psychology*, 8(1), 23–34. <https://doi.org/10.20982/tqmp.08.1.p023>
- Hardy, I., Decristan, J. & Klieme, E. (2019). Adaptive teaching in research on learning and instruction. *Journal for Educational Research Online*, 11(2), 169–191.
- Häyrynen, T., Serenius-Sirve, S. & Korkman, M. (1999). *Lukilasse – Lukemisen, kirjoittamisen ja laskemisen seulonatesti 1–6 vuosiluokille [test for reading, spelling and arithmetics for Grades 1–6]*. Psykologien kustannus.
- Holopainen, L., Koch, A., Hakkarainen, A. & Kofler, D. (2020). Predictors of reading skills at the first and second grade: The role of orthography. *Reading Psychology*, 41(5), 461–484. <https://doi.org/10.1080/02702711.2020.1768988>

- Hu, L. & Bentler, P.M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional versus new alternatives. *Structural Equation Modeling*, 6(1), 1–55. <https://doi.org/10.1080/10705519909540118>
- Jaeger, E.L. (2016). Negotiating complexity: A bioecological systems perspective on literacy development. *Human Development*, 59(4), 163–187. <https://doi.org/10.1159/000448743>
- Juel, C. & Minden-Cupp, C. (2000). Learning to read words: Linguistic units and instructional strategies. *Reading Research Quarterly*, 35(4), 458–492. <https://doi.org/10.1598/RRQ.35.4.2>
- Kikas, E., Pakarinen, E., Soodla, P., Peets, K. & Lerkkanen, M.-K. (2017). Associations between reading skills, interest in reading, and teaching practices in first grade. *Scandinavian Journal of Educational Research*, 62(6), 832–849. <https://doi.org/10.1080/00313831.2017.1307272>
- Kikas, E., Silinskas, G., Jögi, A.-L. & Soodla, P. (2016). Effects of teacher’s individualized support on children’s reading skills and interest in classrooms with different teaching styles. *Learning and Individual Differences*, 49, 270–277. <https://doi.org/10.1016/j.lindif.2016.05.015>
- Kiuru, N., Nurmi, J.-E., Leskinen, E., Torppa, M., Poikkeus, A.-M., Lerkkanen, M.-K. et al. (2015). Elementary school teachers adapt their instructional support according to students’ academic skills: A variable and person-oriented approach. *International Journal of Behavioral Development*, 39(5), 391–401. <https://doi.org/10.1177/0165025415575764>
- Lepola, J., Lynch, J., Kiuru, N., Laakkonen, E. & Niemi, P. (2016). Early oral language comprehension, task orientation, and foundational reading skills as predictors of grade 3 reading comprehension. *Reading Research Quarterly*, 51(4), 373–390. <https://doi.org/10.1002/rrq.145>
- Lerkkanen, M.-K. (2007). The beginning phases of reading literacy instruction in Finland. In P. Linnakylä & I. Arffman (Eds.), *Finnish reading literacy. When quality and equity meet*. (pp. 155–174). University of Jyväskylä, Institute for Educational Research.
- Lerkkanen, M.-K., Kiuru, N., Pakarinen, E., Poikkeus, A.-M., Rasku-Puttonen, H., Siekkinen, M. et al. (2016). Child-centered versus teacher-directed teaching practices: Associations with the development of academic skills in the first grade at school. *Early Childhood Research Quarterly*, 36, 145–156. <https://doi.org/10.1016/j.ecresq.2015.12.023>
- Lerkkanen, M.-K., & Pakarinen, E. (2021). Teacher and Student Stress and Interaction in Classroom (TESSI) study. <https://doi.org/10.17011/jyx/dataset/77741>
- Lerkkanen, M.-K., Poikkeus, A.-M. & Ketonen, R. (2006). *ARMI – Luku- ja kirjoitustaidon arviointimateriaali 1. luokalle [ARMI – A tool for assessing reading and writing skills in grade 1]*. WSOY.
- Lerkkanen, M.-K., Rasku-Puttonen, H., Aunola, K. & Nurmi, J.-E. (2004). Predicting reading performance and the second year of primary school. *British Educational Research Journal*, 30(1), 67–92. <https://doi.org/10.1080/01411920310001629974>
- Linnakylä, P., Välijärvi, J. & Arffman, I. (2007). Reading literacy – High quality by means of equity. In P. Linnakylä & I. Arffman (Eds.), *Finnish reading literacy. When quality and equity meet*, (pp. 155–174). University of Jyväskylä, Institute for Educational Research.
- Muthén, L. & Muthén, B.O. (2012). *1998–2012. Mplus users guide*. (7th edn). Muthén & Muthén.
- Nurmi, J.-E., Kiuru, N., Lerkkanen, M.-K., Niemi, P., Poikkeus, A.-M., Ahonen, T. et al. (2013). Teachers adapt their instruction in reading according to individual children’s literacy skills. *Learning and Individual Differences*, 23, 72–79. <https://doi.org/10.1016/j.lindif.2012.07.012>
- Official Statistics of Finland [OFS]. (2018). Educational structure of population (ISSN=2242–2919) [Data set]. [http://www.stat.fi/til/vkour/index\\_en.html](http://www.stat.fi/til/vkour/index_en.html)
- Pakarinen, E., Lerkkanen, M.-K., Poikkeus, A.-M., Siekkinen, M. & Nurmi, J.-E. (2011). Kindergarten teachers adjust their teaching practices in accordance with children’s academic pre-skills. *Educational psychology: An International Journal of Experimental Educational Psychology*, 31(1), 37–53. <https://doi.org/10.1080/01443410.2010.517906>
- Parsons, S., Vaughn, M., Qualls Scales, R., Gallagher, M.A., Parsons, A.W., Davis, S.G. et al. (2018). Teachers’ instructional adaptations: A research synthesis. *Review of Educational Research*, 88(2), 205–242. <https://doi.org/10.3102/0034654317743198>
- Poikkeus, A.-M., Lerkkanen, M.-K., Ruotsalainen, J., & Soodla, P. (2013). *Finnish and Estonian adaptation of the ISI classroom observation system. Based on individualizing student instruction classroom observations coding manual. Version 40.11.02.2010 authored by C.M. Connor, S. Piasta, S. Al Otaiba, S. Day, F.J. Morrison, and C. Cameron*. 2010. Unpublished manual. Jyväskylä: University of Jyväskylä. Tallinn: University of Tallinn.
- Pressley, M., Wharton-McDonald, R., Allington, R., Collins Block, C., Morrow, L., Tracey, D. et al. (2001). A study of effective first-grade literacy instruction. *Scientific Studies of Reading*, 5(1), 35–58. [https://doi.org/10.1207/S1532799XSSR0501\\_2](https://doi.org/10.1207/S1532799XSSR0501_2)

- Ruotsalainen, J., Soodla, P., Rääkkönen, E., Poikkeus, A.-M., Kikas, E. & Lerkkanen, M.-K. (2022). Literacy instruction activities and their associations with first graders' reading performance in two transparent orthographies. *Compare: A Journal of Comparative and International Education*, 52(1), 92–109. <https://doi.org/10.1080/03057925.2020.1742093>
- Seymour, P.H.K., Aro, M. & Erskine, J.M. (2003). Foundation literacy acquisition in European orthographies. *British Journal of Psychology*, 94(2), 143–174. <https://doi.org/10.1348/000712603321661859>
- Silvén, M., Poskiparta, E., Niemi, P. & Voeten, M. (2007). Precursors of reading skill from infancy to first grade in Finnish: Continuity and change in a highly inflected language. *Journal of Educational Psychology*, 99(3), 516–531. <https://doi.org/10.1037/0022-0663.99.3.516>
- Soodla, P., Lerkkanen, M.-K., Niemi, P., Kikas, E., Silinskas, G. & Nurmi, J.-E. (2015). Does early reading instruction promote the rate of acquisition? A comparison of two transparent orthographies. *Learning and Instruction*, 38, 14–23. <https://doi.org/10.1016/j.learninstruc.2015.02.002>
- Ukkola, A. & Metsämuuronen, J. (2019). Alkumittaus – Matematiikan ja äidinkielen ja kirjallisuuden osaaminen ensimmäisen luokan alussa [pre-measurement – students' skills in mathematics and literacy in the beginning of grade 1]. Finnish education evaluation Centre. Publications 17:2019. Finnish education evaluation Centre.
- van de Pol, J., Volman, M. & Beishuizen, J. (2010). Scaffolding in teacher–student interaction: A decade of research. *Educational Psychology Review*, 22(3), 271–296. <https://doi.org/10.1007/s10648-010-9127-6>
- Virinkoski, R., Eklund, K., Lerkkanen, M.-K., Holopainen, L. & Aro, M. (2021). Development of reading and arithmetic skills across grades 1 to 4 in two groups of children receiving part-time special education. *Learning and Individual Differences*, 85. Advance online publication. <https://doi.org/10.1016/j.lindif.2020.101956>
- Virinkoski, R., Lerkkanen, M.-K., Eklund, K., Holopainen, L. & Aro, M. (2017). Teachers' ability to identify children at early risk for reading difficulties in grade 1. *Early Childhood Education Journal*, 46(5), 497–509. <https://doi.org/10.1007/s10643-017-0883-5>

**Jenni Ruotsalainen**, MA (Education), MA (Psychology), is a PhD candidate at the Department of Teacher Education, University of Jyväskylä, Finland.

**Eija Pakarinen**, PhD, is an associate professor of education at the Department of Teacher Education, University of Jyväskylä, Finland.

**Anna-Maija Poikkeus**, PhD, is a professor at the Department of Teacher Education and dean of Faculty of Education and Psychology, University of Jyväskylä, Finland.

**Marja-Kristiina Lerkkanen**, PhD, is a professor at the Department of Teacher Education, University of Jyväskylä, Finland, and at Norwegian Centre for Learning Environment and Behavioural Research in Education, University of Stavanger, Norway.

*Received 8 December 2020; revised version received 22 November 2021.*

**Address for correspondence:** Jenni Ruotsalainen, Department of Teacher Education, University of Jyväskylä, University of Jyväskylä, Jyväskylä 40014, Finland.  
E-mail: [jenni.m.ruotsalainen@jyu.fi](mailto:jenni.m.ruotsalainen@jyu.fi)