

# In the Classroom: Putting Multiliteracies into Practice: Digital Storytelling for Multilingual Adolescents in a Summer Program

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In this article, it is demonstrated how the authors created a context in which digital storytelling was designed and implemented to teach multilingual middle school students in a summer program. Tasks and activities were designed to align with the four components of a multiliteracies pedagogy (i.e., situated practice, overt instruction, critical framing, and transformative practice) in order to engage the students in exploring their multiple literacies and identities by using multiple semiotic modes and resources (e.g., texts, images, and sounds). The digital storytelling lesson shows that multiliteracies practices can be a powerful venue for second-language learners and teachers.

**Authors: Tuba Angay-Crowder, Jayoung Choi & Youngjoo Yi**

Source: Angay-Crowder, T., Choi, J. & Yi, Y. (2013). In the classroom: Putting multiliteracies into practice: Digital storytelling for multilingual adolescents in a summer program.

- In this article it is demonstrated how the theoretical concept of multiliteracies can be applied to a pedagogic practice.
- It is described how 12 adolescent multilingual students were engaged in the multiliteracies practice of digital storytelling (i.e., multimedia composing that consists of texts, images, and sounds to tell stories) during a summer program.
- The Digital Storytelling Class was designed in order a) to examine how a theoretical framework (i.e., multiliteracies) could be translated into teaching multilingual adolescents; and b) to create a context in which students could explore their multiple literacies and identities using multiple semiotic modes and resources.

## **Multiliteracies**

- The term multiliteracies addresses the multiplicity of communication channels and media and the increasing saliency of cultural and linguistic diversity.
- The multiliteracies theory of pedagogy integrates four components: a) situated practice; b) overt instruction; c) critical framing; and d) transformed practice.
- Situated practice is an immersion in meaningful practices within a community of learners who are capable of playing multiple and different roles based on their background and experiences.
- Overt instruction includes active interventions on the part of the teacher and other experts that scaffold learning activities and allow the learners to gain explicit information.
- Through critical framing, which involves both cognitive and social dimensions of literacy pedagogy, students step back from what they have learned, critique their learning, and extend and apply their learning in new

contexts.

- Transformed practice involves students' transfer, reformulation, and redesign of existing texts and meaning-making practice from one context to another.

## **Digital storytelling**

- Digital storytelling can provide students with rich opportunities a) to explore, express, and reflect on themselves; b) to enhance critical thinking; c) to foster academic achievement; and d) to build leadership skills.
- For multilingual adolescent students, digital storytelling can provide an opportunity to design multimodal narratives that represent and reflect on their sociocultural identities and their lives.



## **The study**

The digital storytelling class took place in a traditional classroom and a computer lab for 90 minutes twice a week during a four-week summer program, and 12 students in Grades 7 and 8 were carefully selected to take part. All the students were children of immigrants and spoke a language other than English at home.

## **Designing and conducting the digital storytelling class**

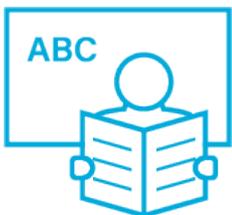
- The class was designed and conducted for a total of seven sessions.
- **Building a foundation for digital storytelling (Sessions 1 and 2)**
  - During the first week, situated practice and overt

instruction were employed to teach the students 'what digital storytelling is,' 'how it can be created,' and 'why students need to consider their purpose and audience in digital storytelling.'

- In the first session, a needs analysis was conducted in which students reported their preferred out-of-school activities, their use of technology, and their L1 proficiency.
  - The students brainstormed potential topics for their digital stories based on initial conversations about their interests.
  - The students were challenged to reflect critically on their topic selection and to reframe their choices while raising questions that helped them think harder about whether their topics could serve their purposes and entertain their audience.
  - Also, overt instruction was offered that aimed to scaffold learning activities and give students explicit information about the nature of digital storytelling.
  - After an initial free writing phase, the students filled out a storyboard template while carefully considering multiple modes (e.g., narration, images, audio) for each slide so that they could express their meaning effectively and creatively in their digital stories.
- **Writing narrative for digital storytelling (Sessions 3 and 4)**
- The second week centred on strengthening the students' narratives of their digital stories.
  - A series of situated writing activities were implemented in class, such as responding to writing prompts, outlining a narrative, composing a structured essay based on their outlines, and participating in individual writing conferences.
  - For example, students were asked to respond to 'What message do you want to convey to your

audience?’

- **Orchestrating text, image, and sound (Sessions 5 and 6)**
  - The primary tasks during the third week involved selecting appropriate images and sound, modifying linguistic text, and recording a narration.
  - The students were lead to reflect critically on their process of composing, from writing print-based narratives to selecting and orchestrating both linguistic and non-linguistic modes for a digital story.
  - Students were asked questions such as, ‘What effect does this image or sound have on your overall meaning?’
  - Students’ insertion of narrative or text in their first or heritage language and their consultations about their projects with parents and other adults in their communities were indications of transformed practice at work.
- **Reflecting, sharing, and celebrating (Session 7)**
  - During the last week, students celebrated their final productions by reflecting on the whole process of creating digital stories and sharing their projects with an audience.
  - Students were asked questions such as ‘What was it like to make the project?’



## Conclusions

- Engaging students in multiliteracies gives us some valuable insights into what counts as literacy learning

and teaching and how we reframe literacy pedagogy in classrooms.

- Both conventional print-based and computer-based multimodal composing practices seem to help students expand their literacy repertoire and means of expression.
- Digital storytelling can develop students' leadership skills as they work as a team, set goals, manage time and resources, and construct a positive identity.
- Providing specific guidance to students throughout the digital storytelling process and creating a collaborative environment in which both students and the teachers learn from one another are essential to an efficacious multiliteracies pedagogy.

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## **Investigating Bidirectional Links Between the Quality of Teacher-Child Relationships and Children's Interest and Pre-Academic Skills in Literacy and Math**

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This study investigated bidirectional links between the quality of teacher-child relationships and children's interest and pre-academic skills in literacy and math and gender differences in them. Teacher-perceived conflict predicted lower interest and pre-academic skills in both literacy and math. Results were similar for boys and girls.

**Authors: Eija Pakarinen, Marja-Kristiina Lerkkanen, Jaana Viljaranta & Antje von Suchodoletz**

Source: Pakarinen, E., Lerkkanen, M.-K., Viljaranta, J. & von Suchodoletz, A. (2021). Investigating bidirectional links between the quality of teacher-child relationships and children's interest and pre-academic skills in literacy and math. *Child Development*, 92(1), 388-407. DOI: 10.1111/cdev.13431

This study investigated bidirectional links between the quality of teacher-child relationships and children's interest and pre-academic skills in literacy and math and gender differences in them. Participants were 461 Finnish kindergarteners (six-year-olds) and their teachers (n = 48). Teacher-perceived conflict predicted lower interest and pre-academic skills in both literacy and math. Results were similar for boys and girls. Implications for reducing conflictual patterns of relationships together with promoting other factors are discussed.

- Kindergarten represents a crucial context in which children develop school-related skills and patterns of engagement that form the basis for the development of later competencies important for academic success.

- Above and beyond children's skills, previous literature has highlighted the benefits of positive teacher-child relationships for both academic and socio-emotional outcomes.

### **Teacher-child relationships**

- Supportive relationships with teachers are defined by a combination of high levels of closeness and low levels of conflict.
- Close relationships with teachers are characterised by warmth, approachability, and open communication.
- In such relationships, children can use their teacher as a secure base from which to take advantage of the learning opportunities provided.
- Coercive relationships can be characterised as conflictive ones where tension and anger exist within the teacher-child relationship.
- Teacher-perceived conflict with children has been linked to less favourable outcomes, such as lower achievement and higher levels of problem behaviours.

### **Theoretical perspectives on teacher-child relationships and child outcomes**

- Relationship-driven models are based on attachment theory, arguing that warm and supportive relationships between children and caregivers are crucial for favourable developmental outcomes.
- Self-determination theory (SDT) posits that individual propensity to seek challenges and enjoy mastering new learning unfolds when basic psychological needs for competence, autonomy, and relatedness are met in the classroom.
- Child-driven models propose the opposite direction of influence, that is, children's academic skills and interest in learning affect the quality of their relationships with their teachers.

- Bidirectional models are based on transactional theory, assuming that developmental outcomes are the product of a combination of an individual child's characteristics and the experiences and aspects of their environment.



## The study

The goal of the present study was to examine possible bidirectionality between teacher-child relationship quality measured by teacher-perceived closeness and conflict with individual children and child outcomes measured by the child's interest and pre-academic skills in literacy and math.

Research questions:

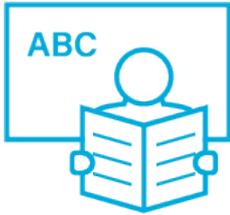
1. Do closeness/conflict predict child outcomes (relationship-driven model), or do child outcomes predict closeness/conflict (child-driven model), or are closeness/conflict and child outcomes reciprocally related (bidirectional model)?
2. Does gender moderate the associations between teacher-child relationship quality and child outcomes?

**The participants** were 461 children (222 boys) enrolled in 48 kindergarten classrooms from 32 centres.



## Findings

- The relationship-driven model, which included stability paths and a predictive path from closeness and conflict to interest and pre-academic skills, best described the data.
- The quality of teacher-child relationships, pre-literacy skills, and interest in literacy were stable across time.
- Teacher-perceived conflict at kindergarten entry predicted lower interest in literacy and pre-literacy skills at the end of kindergarten.
- Regarding the control variables, maternal affection was positively related to pre-literacy skills at the end of kindergarten.
- Behaviour problems and negative emotionality were positively related to conflict, whereas inhibition was negatively associated with teacher-perceived closeness.
- Regarding gender differences, the main results were similar between genders, but there were some gender-related patterns between control variables and relationship quality: behavioural problems were related to teacher-perceived conflict only among boys, and a higher level of inhibition was related to a lower level of conflict in girls.
- Similar with the literacy model, the model comparison for the math model also indicated that the relationship-driven model, which included stability paths and a predictive path from closeness and conflict to interest and skills in math, best described the data.
- Teacher-perceived conflict at kindergarten entry predicted children's lower interest in math and pre-math skills at the end of kindergarten.
- The results were mainly similar for boys and girls; however, pre-math skills promoted subsequent interest in math, and behaviour problems increased conflict only among boys



## Conclusions

- The relationship-driven model best described the data for interest and pre-academic skills in literacy and math: teacher-perceived conflict predicted lower interest and skills in both literacy and math.
  - The results were largely similar for boys and girls.
  - It can be suggested that a relationship with one's teacher without conflict and coercive interactions meets children's needs for relatedness and belonging at school and therefore supports the development of their intrinsic motivation and achievement.
  - It can also be suggested that teacher-perceived coercive interactions and negative emotions are harmful for children's engagement in learning and diminish their interest in academic tasks.
  - Because teachers may be more able to provide support, praise, and constructive feedback than to decrease conflict, interventions and teacher preparation programs should focus on building and fostering the positive aspects of a relationship with each child.
  - Teacher education programs may benefit from educating teachers not only about academic content and pedagogical practices, but also about strategies that build supportive relationships with children.
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# Effects of Teacher's Individualized Support on Children's Reading Skills and Interest in Classrooms with Different Teaching Styles

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The purpose of the study was to examine whether teacher's individualised support affects students' reading skills and interest in classrooms with different teaching styles. The results showed that relations between individualized support and students' later reading comprehension skills and interest differed between classrooms with different teaching styles. While individualized support enhanced interest in reading in classrooms employing mixed child-centred and teacher-directed styles, it inhibited interest in classrooms with child-dominated styles.

**Authors: Eve Kikas, Gintautas Silinskas, Anna-Liisa Jõgi & Piret Soodla**

Source: Kikas, E., Silinskas, G., Jõgi, 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. DOI: <https://doi.org/10.1016/j.lindif.2016.05.015>

The purpose of the study was to examine whether a teacher's individualised support affects students' reading skills and interest in classrooms with different teaching styles. The participants were 552 children (273 boys) and their 21 homeroom teachers. The results showed that relations between individualized support and students' later reading comprehension skills and interest differed between classrooms with different teaching styles. While individualized support enhanced interest in reading in classrooms employing mixed child-centred and teacher-directed styles, it inhibited interest in classrooms with child-dominated styles. In the classrooms with child-dominated teaching styles, higher individualised support was related to lower reading comprehension skills.

- Outside of home, teachers constitute the most proximal environmental context for young children's academic and motivational development, yet they differ in teaching practices, teaching styles, and how they individualise their teaching.
- While some studies have shown that increased individualised instruction has a positive impact on children's skill development, others have not.
- Based on active, leading roles of teachers or children, three dimensions of teaching practices – child-centred, teacher-directed, and child-dominated – have been described.

### **Child-centred practices**

- Teachers actively organise children's learning activities.
- They consider children's interests, allow children to construct their knowledge, and provide emotional support and encouragement.

### **Teacher-directed practices**

- Teachers give detailed tasks and frequent feedback, praise children for correct answers rather than effort, and children have to usually follow teacher directions.

### **Child-dominated practices**

- Teachers remain quite passive.
- They respond to children's questions and interrupt only when violations of discipline occur, giving feedback when asked but rarely providing emotional support.



### **The study**

This study examined whether the effects of individualised support for reading skills and interest differ depending on whether teachers utilise different teaching styles.

Hypotheses:

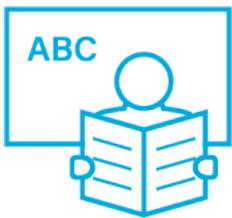
1. Individualised support in child-centred and mixed classrooms will have a positive effect on both skills and interest.
2. Individualised support in child-dominated classrooms will have a negative effect on all studied outcomes (reading fluency, comprehension, and interest).

**The participants** were 552 children from seven schools and 21 classrooms and their homeroom teachers.



## Findings

- Teachers' individualised support in grade 1 negatively predicted reading comprehension in grade 2.
- Children's fluency and reading comprehension in grade 1 negatively predicted teachers' support in grade 2.
- The association between teachers' support in grade 1 and children's interest in reading in grade 2 was not significant for the child-centred teaching style group.
- It was positive for the mixed group and negative for the child-dominated teaching style group.
- Teachers' support in grade 1 negatively predicted reading comprehension in grade 2 with a mixed teaching style group, whereas in other groups this association was not significant.



## Conclusions

- Classrooms with different teaching styles maintained different relations between individualised teacher support and students' later reading comprehension skills and interest.
- Individualised teacher support did not have any significant effect on reading skills and interest when the child-centred style was used in the classroom.
- In the groups with teachers using the mixed teaching style combining child-centred and teacher-directed practices, individualised support was negatively related to students' comprehension skills, but it had a supportive effect on their interest in reading.
- In the classrooms with child-dominated teaching styles,

individualised support tended to predict lower interest and reading comprehension skills.

- Teachers should be encouraged to apply both child-centred (e.g. considering children's interests when providing reading material, focusing on comprehension during reading activities, providing emotional support in reading activities) and teacher-directed (e.g. practicing reading accuracy and fluency) types of activities but avoid relying on child-dominated practices.

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# Associations Between Reading Skills, Interest in Reading, and Teaching Practices in First Grade

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This study examined associations between classroom-level reading fluency, comprehension, interest in reading, and teaching practices. In classrooms with mostly child-centred methods, children showed better reading fluency, comprehension, and higher interest, whereas in classrooms with

predominantly teacher-directed practices, children had lower reading comprehension at the end of grade 1.

**Authors: Eve Kikas, Eija Pakarinen, Piret Soodla, Kätlin Peets & Marja-Kristiina Lerkkanen**

Source: Kikas, E., Pakarinen, E., Soodla, P., Peets, K. & Lerkkanen, M.-K. (2018). Associations between reading skills, interest in reading, and teaching practices in first grade. *Scandinavian Journal of Educational Research*, 62(6), 832-849. DOI: 10.1080/00313831.2017.1307272

This study examined associations between classroom-level reading fluency, comprehension, interest in reading, and teaching practices. Participants were 466 children from 21 classrooms. Teachers were more likely to use teacher-directed methods in classrooms where children had poorer initial reading fluency. In classrooms with mostly child-centred methods, children showed better reading fluency, comprehension, and higher interest, whereas in classrooms with predominantly teacher-directed practices, children had lower reading comprehension at the end of grade 1.

- It is widely accepted that teaching practices influence children's learning and development.
- Numerous studies show the positive effects of child-centred (learner-centred) teaching practices on children's academic skills and motivation; however, some studies have found beneficial effects from teacher-directed practices on the development of basic academic skills.
- Teachers do not uniquely influence children's academic and motivational development, but children also affect the practices teachers use.

### **Child-centred and teacher-directed teaching practices**

- Child-centred and teacher-directed practices differ in the degree to which teachers allow children to actively

construct their knowledge (vs. teach basic skills), include children in various discipline-related decision processes (vs. set the rules), and engage in creating a positive social climate via individual support.

- While teacher-directed practices value frequent feedback on academic tasks, child-centred practices emphasize the importance of emotional support and encouragement.
- There are benefits of child-centred practices across the academic, motivational, and social domains of functioning at the individual as well as the classroom level.
- There is also evidence that teacher-directed practices can be beneficial in kindergarten and primary school, and/or for students with poorer academic skills when learning basic academic skills such as letter knowledge, decoding, and numeracy skills.
- However, there is evidence that teacher-directed practices may hinder motivation, including interest.

### **The influence of student characteristics on teaching practices**

- Teachers are continuously required to make decisions about their instruction, classroom management, and support while considering the needs of students and the aims of teaching.
- For instance, Vygotsky (1978) emphasized that the most effective learning takes place in the zone of proximal development (ZPD); thus, teachers should modify their methods and tasks to correspond to children's skill levels.
- Not only individual, but also collective student characteristics can influence the kinds of practices teachers use.
- However, which practices teachers use with individual children vs. the whole classroom may differ depending on teachers' knowledge and beliefs.



## The study

The aim of the present study was to examine associations between classroom-level reading fluency, comprehension, and interest in reading and teaching practices in first-grade classrooms.

Research questions:

1. Do classroom-level initial reading fluency and interest predict child-centred teaching practices, and do these practices in turn predict children's reading skills and interest at the end of the school year?
2. Do classroom-level initial reading fluency and interest affect teacher-directed teaching practices, and do these practices affect children's reading fluency, text comprehension, and interest at the end of the first school year?

**The participants** were 466 children (233 girls and 233 boys) from 21 first-grade classrooms from seven public schools with Estonian as the principal language. In Estonia, children usually attend schools based on proximity. All 21 first-grade teachers were female.



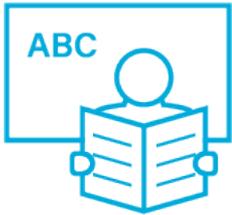
## Findings

- The results showed that the more child-centred teaching practice teachers used, the better the children's

reading fluency and comprehension skills at the end of first grade were.

- Initial reading fluency and interest in reading typical of the classroom did not predict child-centred teaching practices.
- The higher the parental educational level was, the better the reading fluency the children showed in that classroom when entering school.
- Teacher experience or class size did not predict teaching practices or reading skills.
- At the individual level, the higher the parental educational level, the higher the child's level of reading fluency and reading comprehension were at the end of first grade.
- Girls showed higher interest in reading and better reading fluency at the beginning of the school year, as well as better reading comprehension at the end of first grade.
- The more child-centred teaching practice a teacher employed, the more interest in reading the children reported in that classroom at the end of the school year.
- Teacher experience, class size, and parental educational level did not predict children's interest in reading or teaching practices.
- Teachers were found to provide more teacher-directed practices in classrooms where children scored lower on initial reading fluency.
- Teacher-directed practices were negatively associated with children's reading comprehension, but not with reading fluency at the end of grade 1 after controlling for children's previous reading fluency and interest in reading.
- Children's initial reading fluency was negatively associated with teacher-directed practices.
- Teacher-directed teaching practices were not significantly related to children's interest in reading.

- Interest in reading at the end of the first grade was predicted by initial interest in reading, gender, and family education, indicating that interest in reading showed moderate stability and was significantly higher at the end of the first school year among girls and children from highly educated families.



## Conclusions

- The results showed that child-centred practices were related to higher reading skills and interest in reading at the end of grade 1.
- An effect was found for collective student characteristics on teacher-directed practices: in classrooms where children had poorer initial reading fluency, teachers relied more frequently on teacher-directed practices.
- Teacher-directed practices were in turn related to poorer reading comprehension at the end of grade 1.
- Child-centred teaching practices were associated with children's better reading skills and interest in reading at the end of first grade, even after controlling for the initial levels of children's reading fluency and interest.
- Thus, in classrooms where teachers generally encourage children's active construction of knowledge, emphasize the discussions about rules and activities, and provide emotional support, children's specific skills such as reading fluency and comprehension improve.
- It is possible that teachers who use child-centred

methods expose children more frequently to varied types of texts and give children more possibilities to choose what to read, but also discuss the reading material and thereby promote children's interest in reading.

- Teachers may prefer teacher-directed methods with children who have poorer academic skills because they believe in the effectiveness of such practices and it may make it easier for them to manage classroom situations.
- However, no beneficial effect of teacher-directed practices on reading fluency was found, and teacher-directed methods were related to lower-level reading comprehension at the end of first school year.
- Teachers should be encouraged to rely on child-centred teaching practices in the beginning of school when trying to improve children's reading skills and interest in reading.
- This study also informs us about the negative effects of teacher-directed practices on reading comprehension and interest.
- These practices do not satisfy children's basic needs for belongingness and autonomy, and instead seem to be inhibiting the development of more complicated skills like reading comprehension.
- Teachers should try to create classroom environments where children feel that their teachers are supportive and encouraging and that they are regarded as active participants in the teaching process.
- It is important for educators to make sure that young teachers are provided with a set of practical skills to best nurture children's academic, motivational, and emotional needs and that they are not left alone when challenges arise in the classroom.

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# The Role of Part-Time Special Education Supporting Students with Reading and Spelling Difficulties from Grade 1 to Grade 2 in Finland

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The aim of the study is to evaluate the reading and spelling skills of Finnish children in grades 1 and 2 receiving part-time special education from special education teachers for reading and spelling difficulties (RSD) and for RSD with other learning difficulties. The results showed that the reading and spelling skills of students with RSD lagged behind age level and that students with overlapping difficulties exhibited even slower development. Small group education and a moderate amount of part-time special education (approximately 38 h per year) predicted faster skill development.

**Authors: Leena K. Holopainen, Noona H. Kiuru, Minna K. Mäkihonko & Marja-Kristiina Lerkkanen**

Source: Holopainen, L.K., Kiuru, N.H., Mäkihonko, M.K. & Lerkkanen, M.-K. (2018). The role of part-time special education supporting students with reading and spelling

difficulties from grade 1 to grade 2 in Finland. *European Journal of Special Needs Education*, 33(3), 316-333. DOI: 10.1080/08856257.2017.1312798

The aim of the study is to evaluate the reading and spelling skills of Finnish children in grades 1 and 2 receiving part-time special education from special education teachers for reading and spelling difficulties (RSD) and for RSD with other learning difficulties. Of 152 children involved in the study, 98 received part-time special education for RSD, and 54 did not have RSD and did not receive special education. The results showed that the reading and spelling skills of students with RSD lagged behind age level and that students with overlapping difficulties exhibited even slower development. Small group education and a moderate amount of part-time special education (approximately 38 h per year) predicted faster skill development, whereas individual and large amount of special education (more than 48 h per year) were related to slower skill development and broader difficulties.

- Reading acquisition primarily requires performance of the alphabetic principle formed by letter-sound knowledge and phonemic skills, followed by maintenance of the detected phoneme in short-term memory to a synthesis of all read phonemes and finally a recognition of word meaning after generating the phoneme sequence.
- Orthographic complexity also affects reading and spelling (RS) development.
- The acquisition of spelling procedures is also affected by the orthographic consistency of the language as well as features of the oral language and the linguistic structure complexity.
- The process of learning to read and spell is challenging for 5% to 18% of school-age children depending on the criteria chosen to define reading and spelling difficulties (RSD).

- Moreover, evidence suggests that about 40% of school-aged children with one developmental disorder will also suffer another developmental disorder.

### **Effective reading instruction for students with RSD**

- Explicit and systematic instruction.
- Foundational skills such as phonemic awareness and phonics/word study are essential elements of instruction.
- Higher processing skills such as fluency, vocabulary, and comprehension are essential from the beginning of reading instruction.
- Students who have difficulties benefit from smaller group instruction (five or fewer students).

### **Overview of support systems for RSD**

- Many studies show that students fail to progress in reading in different support settings, and even when gains in reading achievement are made, there is little evidence that these students meet grade-level expectations after years of special education services.
- According to Swanson (2008), reading instruction for students with LD is generally of low quality and includes little to no explicit instruction in phonics or comprehension strategies.
- The common belief is that students with RSD need instruction at a slower pace and not a greater amount of instruction.
- Students with RSD benefit from intensive interventions, and many of these students require such interventions for multiple years.

### **Finnish educational system**

- Finnish comprehensive school starts at age seven.
- One school year includes 38 weeks.
- There is also one year of pre-primary education for six-

year-old children (kindergarten) which creates a foundation (e.g. for literacy skills).

- Systematic phonics-based teaching of reading begins in grade 1.
- The development of syllable reading is important for reading fluency because two, three, four, and more multi-syllable words are frequent, and the number of one-syllable words is limited.
- In basic education, students do not need a formal diagnosis to receive special educational services.
- The most common form is part-time special education given by a special education teacher.
- It is a form of educational support in which students are in general education classes receiving support for 1 to 2 h per week from a special education teacher.
- Typically, it is put into practice in a small group (3 to 4 students at the same time) or individually.
- Usually, special education teaches reading and spelling simultaneously with phonics-based methods, motivating students by board games or computer programs.



## **The study**

This study examined the development of RS skills among Finnish children in grades 1 and 2 who receive part-time special education for RSD from special education teachers.

Research questions:

1. Are there differences in the RS skills development of students in grades 1 and 2 who a) receive part-time special education for RSD and b) have no RSD and do not receive special education support? Is mean-level skill

development different between children with only RSD and those with overlapping difficulties?

2. To what extent do the amount and the form of special education and the presence of only RSD or RSD and overlapping difficulties predict RS development among children who receive special education for RSD?

**The participants** of this study were 152 children (63 girls, 89 boys). In the present study, 98 children were identified as at risk for RSD already in kindergarten and received part-time special education for RSD in grade 1. Out of these children, 56 received special education only for RSD. For the present study, 54 intensively followed control children with no RSD risk from the same classrooms as the risk for RSD children and who received no special education were randomly selected. The special education teachers were asked to rate the students who had received part-time special education during the first grade. Students RS skills were assessed during the autumn of grade 1 (T1), the spring of grade 1 (T2), and the spring of grade 2 (T3).



## Findings

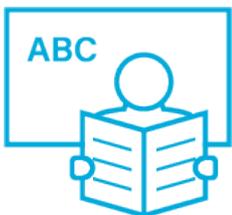
- The results show not time x group -interaction for reading skills, but the main effects of time and group were significant.
- Children's reading skills developed significantly during the follow-up period.
- The differences in reading skills favouring children without RSD remained relatively large across the follow-up period.
- The results for spelling skills, in contrast, show a

significant time x group interaction.

- Spelling skills developed faster, especially from T2 to T3, among children with RSD who received part-time special education compared to children without RSD who received no special education.
- The skill difference favouring children with no RSD was statistically significant in T1 and T2, but only marginally significant in T3.
- In other words, students with RSD who received part-time special education partly caught up to the level of other students.
- The development of reading skills from T2 to T3 was fastest among children with only RSD who received part-time special education and slowest among children with RSD and language problems.
- Children with no RSD or special education had better reading skills than all the other groups at every time point.
- In addition, children with RSD and attention difficulties had marginally significantly better reading skills than students with RSD and language difficulties and students with RSD and other learning difficulties.
- Also, in the spring of grade 2, students with only RSD and students with RSD and attention difficulties had better reading skills than students with RSD and language problems and students with RSD and other learning difficulties.
- The development of spelling skills from T2 to T3 was fastest among children with only RSD who received part-time special education and slowest among children without RSD and special education.
- Children without RSD or special education had better spelling skills than all other groups at T1.
- At T2, children without RSD or special education had better spelling skills than all the other groups, except for children with RSD and attention difficulties.
- In non-word spelling skills at T3, children without RSD

or special education were no longer significantly different than the children in any other group.

- There were no significant inter-individual differences between the students with RSD who received part-time special education in their reading skills in T1, but they differed in their rate of change in reading skills from T1 to T3.
- A medium amount of special education predicted faster reading skills development than a small or large amount of special education.
- There were no significant inter-individual differences between students with RSD who received part-time special education in their spelling skills, but they did differ in their rate of change in spelling skills from T1 to T3.
- Receiving only small-group special education predicted faster spelling skills development compared to receiving only individual special education or receiving both individual and small-group special education.
- In addition, receiving a medium amount of special education predicted faster spelling skills development than receiving a large amount of special education, and receiving a large amount of special education predicted a slower spelling skills development than receiving a small amount of special education.



## Conclusions

- The results showed that students with RSD lagged their age level in reading skills during the follow-up period,

but after two years, the control group had not achieved better spelling skills than those with RSD.

- Students with only RSD partly attained age-level RS skills, whereas students with other difficulties exhibited clearly slower development.
- Small-group interventions (3 to 4 students) and a medium amount of part-time special education predicted faster development in the RS skills of RSD students.
- With some students, the difficulties are broader and more persistent and they need more intensified or long-lasting support; 1 to 2 h a week at first grade is not enough.

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# Special Education Teachers' Identification of Students' Reading Difficulties in Grade 6

eTale 2022



This study investigated special educational needs (SEN) teachers' assessment practices and the accuracy of their ratings of the students' skill levels in reading fluency and

reading comprehension. Results showed that SEN teachers used several assessment practices simultaneously but mostly relied on observations. Only two-thirds of low-performing students having difficulties in fluency or comprehension were identified.

**Authors: Riitta Virinkoski, Marja-Kristiina Lerkkanen, Kenneth Eklund & Mikko Aro**

Source: Virinkoski, R., Lerkkanen, M.-K., Eklund, K. & Aro, M. (2020). Special education teachers' identification of students' reading difficulties in grade 6. *Scandinavian Journal of Educational Research*, DOI: 10.1080/00313831.2020.1833241

This study investigated special educational needs (SEN) teachers' (n = 29) assessment practices and the accuracy of their ratings of the students' (n = 55) skill levels in reading fluency and reading comprehension. Results showed that SEN teachers used several assessment practices simultaneously but mostly relied on observations. The correlations between the teacher ratings and test scores were significant but moderate in fluency and weak in comprehension. Only two-thirds of low-performing students having difficulties in fluency or comprehension were identified.

- In addition to classroom teachers, special educational needs (SEN) teachers and remedial reading teachers play an essential role in evaluating students' needs for reading support, identifying literacy difficulties, and providing individualised targeted support.
- This study focuses on Finnish SEN teachers and students receiving part-time special education in the sixth grade.
- Some students' reading difficulties (RD) may not manifest themselves in the early school years but might emerge later and become persistent.
- Although identification of students' RD during primary

school has been widely studied, research on teachers' assessment of RD and the accuracy of their assessments before students transition to lower secondary school (i.e. at the end of Grade 6 in the Finnish educational system) is still limited.

### **Teachers' assessment practices**

- Teachers use formative (or informal) assessments to collect data on student's current skills or to improve student's learning by implementing more personalised instruction.
- Assessment tools can be defined as high-stakes or low-stakes.
- The former is connected to the final assessment of how much the student has learned at a certain assessment point, usually in the end of an instructional segment (such as a semester).
- The latter refers to low-stakes continuous instruction comprising assessments before and during instruction.
- Generally, teachers' assessment practices can be divided into tests, curriculum-based measures (CBMs), and qualitative assessments.
- Direct measures refer to tests.
- The accuracy of teachers' ratings of reading fluency and comprehension through observation is low in comparison to the identification of low student reading performance using CBMs and standardised achievement tests.
- CBMs can be used in general, remedial, and special education to monitor students' progress in overall school performance, for example.
- Using CBMs in conjunction with standardized procedures to track students' reading development can lead to higher identification accuracy of struggling readers as well as improvements in reading achievement.

### **Assessment of reading fluency and comprehension**

- One key factor in learning to read fluently is automatic word recognition, which develops through consistent practice, repetition, and reading a wide range of various texts.
- Reading fluency comprises decoding accuracy and automaticity, both of which are connected to reading comprehension.
- One common definition of reading fluency includes reading accuracy and rate, and reading fluency is usually operationalised as the number of correctly read items within a time limit.
- Reading comprehension requires word recognition (i.e. decoding), language comprehension, inference making, and information integration.
- Some examples of common measures to assess reading comprehension are silent reading tasks, either written or oral retell tasks, and picture matching tasks.

### **Associations between teacher ratings and test scores**

- Sensitivity of an assessment tool (i.e. its accuracy in identifying students with problems) has usually been considered important so that support can be allocated to those students who need it most.
- Specificity refers to the accuracy of an assessment tool to correctly identify students who are not at risk.
- An acceptable level of classification accuracy for sensitivity is 90% or above and for specificity 80% or above.
- Despite relatively high overall correlations between teachers' ratings and students' actual test scores, teachers may systemically over- or underestimate students' performances.
- Students with low academic performance are usually judged less accurately than typically performing students.



## The study

The aim of the study was to investigate SEN teachers' assessment practices and the accuracy of their ratings of reading fluency and reading comprehension in grade 6, before students' transition to lower secondary school.

Research questions:

1. What kinds of assessment practices do SEN teachers use to evaluate students' reading performances, and how do they rank different practices?
2. To what extent are SEN teachers' ratings of sixth-grade students' reading fluency and reading comprehension skills associated with students' test scores for the same skills?
3. How accurate are SEN teachers' perceptions of their students' reading fluency and reading comprehension skill levels (low performing or typically performing) compared to the students' test scores?

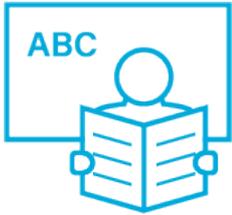
**Teacher sample** included 29 (90% male) SEN teachers. **Student sample** included 55 (65% male) sixth-grade students. Data collection was carried out during the spring term of grade 6.



## Findings

- All teachers used several assessment practices to evaluate their students' reading skills.

- Two kinds of indirect assessment practices were ranked by the SEN teachers as the most important.
- The first was their own observations and the second was their discussions with the parents, other teachers, and the students themselves.
- Direct assessment practices (i.e. tests) were ranked as the most important by only 15% of the teachers.
- Usually, tests were word reading fluency or silent reading comprehension tests.
- Teachers considered most of the students as having no problems with fluency.
- Based on the teachers' ratings, students had more difficulties in comprehension than in fluency.
- Teachers' ratings for reading fluency were significantly correlated ( $.39, p < .01$ ) to students' performances in the two fluency tasks, and there was also a significant correlation between the teachers' ratings and the reading comprehension test scores ( $.24, p < .01$ ).
- According to logistic regression analyses, teachers' ratings were significantly associated with students' categorical reading fluency test scores.
- Instead, according to logistic regression analyses teachers' ratings were not associated with students' categorical reading comprehension test scores.
- Sensitivity rate was rather low and below the acceptable rate for both fluency (63%) and comprehension (70%).
- Additionally, specificity rates for fluency did not quite reach an acceptable accuracy level although it was rather high (69%), and for comprehension, the quite low (20%) specificity rate revealed difficulties with identifying typically performing readers.



## Conclusions

- The most important assessment practices for SEN teachers were qualitative, such as observations and discussions.
- Achievement tests were not among the most important assessment practices, although they were widely used by the teachers, together with some other tools.
- All teachers used several assessment practices in parallel, but they mainly preferred indirect, qualitative assessment practices.
- Assessments based solely on observation are often inaccurate; instead, using various assessment practices together can improve the accuracy, especially when the standardized procedures are combined with CBMs.
- The correlation between the teachers' rating and the test scores for reading fluency was moderate, but the correlation for reading comprehension was weak.
- The moderate and weak correlations between the teachers' rating and the test scores found in this study are substantially lower, compare to those reported in many former studies.
- Teachers' judgments of both reading fluency and reading comprehension were quite inaccurate compared to the test scores.
- The findings indicate that at least 30% of the sixth-grade students struggling with RD were unidentified.
- Specificity rate of reading fluency was rather high but below the optimal rate, indicating that 30% of the typically performing students were unidentified.
- Concerning reading comprehension, most students were incorrectly identified as low achievers, even though their test scores indicated typical performance.

- Teachers need reliable assessment tools throughout primary grades to monitor students' reading progress systematically and continuously.
- Support decisions based mainly on teachers' own perceptions and observations of students' performances can lead to inaccurate assessments.
- One solution for better judgment accuracy could be a structured assessment tool designed for special education purposes enabling teachers to rank-order students' reading performances and compare the rankings with reading test scores.

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# Teachers' Ability to Identify Children at Early Risk for Reading Difficulties in Grade 1

eTale 2022



The aim of the study was to investigate what kinds of assessment practices classroom teachers and special educational needs (SEN) teachers use in assessing first grade students' pre-reading skills (letter knowledge and

phonological skills). Most classroom teachers used qualitative assessment and SEN teachers also relied on tests. The findings underline the importance for developing more specific and reliable assessment tools for pedagogical purposes.

**Authors: Riitta Virinkoski, Marja-Kristiina Lerkkanen, Leena Holopainen, Kenneth Eklund & Mikko Aro**

Source: Virinkoski, R., Lerkkanen, M.-K., Holopainen, L., Eklund, K. & Aro, M. (2018). Teachers' ability to identify children at early risk for reading difficulties in grade 1. *Early Childhood Education Journal*, 46(5), 497-509. DOI: 10.1007/s10643-017-0883-5

The aim of the study was to investigate what kinds of assessment practices classroom teachers and special educational needs (SEN) teachers use in assessing first grade students' pre-reading skills (letter knowledge and phonological skills). The data from two Finnish longitudinal studies were used: JLD sample (class teachers, n = 91; SEN teachers, n = 51; 200 students) and First Steps sample (class teachers, n = 136, SEN teachers, n = 34; 598 students). Most classroom teachers used qualitative assessment, and SEN teachers also relied on tests. Although teacher ratings correlated with the test scores, some children in need of extra support for their early reading development according to test scores remained unidentified. The findings underline the importance for developing more specific and reliable assessment tools for pedagogical purposes.

- Teachers play a key role in identifying the need for early support in reading skill development because they generally observe the first signs of reading difficulties (RD).
- The main purpose of teachers' evaluations of students should be to produce accurate knowledge of the students' skills in order to plan tailored instruction and support when necessary.

- Particularly, children with poor pre-reading skills who are potentially at risk for reading difficulties (RD) should be identified as early as possible.
- Prior studies have shown that screening batteries and standardized achievement tests predict those at risk for reading failure better than teachers' evaluations based on, for example, rating scales, whereas teachers' evaluations have tended to produce high false-negative rates.

### **Assessment of pre-reading skills by teachers**

- To ensure accurate identification, the screening batteries should cover several skill areas related to developing reading skills, such as phonological skills, orthographic and letter knowledge, word reading ability, vocabulary, and syntactic ability.
- However, the accuracy of screening measures differs with respect to sensitivity and specificity.
- Sensitivity refers to the degree of true positives, meaning how accurately the measure identifies students at high risk for RD.
- Specificity refers to the degree of true negatives, or how accurately the measure identifies students at low risk for RD.
- Teachers' assessment practices can be divided into three categories: tests comprising screening or individual test batteries (performance-based assessment), curriculum-based measures (CBM), and qualitative assessments such as observations in the classroom.
- CBM may be used to monitor students' progression in an entire school or classroom, to track an individual's progress toward end-of-year benchmarks or individualised education program goals.
- Teachers' decisions seem to be sometimes based on situational or other irrelevant factors (e.g. gender, behaviour) instead of solely performance assessments.

## **Correspondence between teacher ratings and test scores**

- In most studies, the correlations between teacher ratings and test scores have varied between 0.40 and 0.70.
- Teachers may, however, systematically over- or underestimate student performance.
- Flynn and Rahbar (1998) developed a theory-based screening instrument for teachers to assess reading competency, and their results suggest that teachers' predictions of children at risk for RD can be improved by using rating instruments that include research-validated antecedents of reading with behavioural descriptions of low and high achievement.
- The best predictors of a pre-schoolers' or kindergarteners' later reading achievement when the child has a familial history of dyslexia have proven to be measures that require processing printed material together with oral language proficiency measures and performance-IQ measures.
- Compared to teacher ratings, standardized tests more accurately identify students who are potentially at risk for RD in future.

## **Learning to read in Finnish**

- Finnish children attend kindergarten at age six, and reading instruction begins at age seven when they enter first grade.
- Upon entering school, letter knowledge seems to be one of the best predictors of reading and spelling accuracy in the Finnish language.
- The Finnish orthography is almost purely phonemic: the grapheme-phoneme correspondences are regular and symmetrical at the level of the single letter, and early reading instruction in Finnish almost uniformly rests upon synthetic phonics.
- Finnish students who struggle with reading do not

typically have problems with reading accuracy but do experience persistent problems with reading fluency.

- In the case of RD, the forms of support are remedial teaching during or after school by the class teacher, part-time special education given by the SEN teacher individually or in small groups during school days, or co-teaching by the class teacher and the SEN teacher during normal literacy lessons.



## **The study**

The aim of the study was to investigate teachers' evaluation practices, and the sensitivity and specificity of their assessments or pre-reading skills, especially of children with the lowest achievement, and how the teacher ratings corresponded to the reading test scores at the beginning of the first grade.

Research questions:

1. Which assessment practices do class teachers and SEN teachers use to assess pre-reading skill (e.g. letter knowledge, phonological skills) at the beginning of grade 1?
2. Are teacher ratings associated with test scores in pre-reading skills?
3. How accurately do the teachers identify students' pre-reading difficulties to test scores, and what are the sensitivity and specificity rates of their assessments?

**The data** for this study were drawn from two Finnish longitudinal studies: the Jyväskylä Longitudinal Study of Dyslexia (JLD) and the First Steps study. The JLD data

comprised 91 class teachers, 51 SEN teachers and 200 first-grade students. The First Steps data comprised 136 regular classroom teachers, 34 SEN teachers and 598 children.

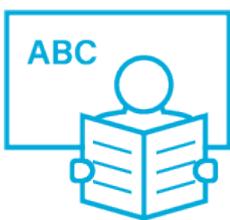


## Findings

- In the JLD sample, most SEN teachers reported that they used only one type of assessment, with qualitative or CBM being the most common.
- If the SEN teachers used two types of assessment practices, they were usually tests combined with qualitative assessments.
- Altogether, tests were used by 47% of the SEN teachers.
- In the First Steps sample, class teachers used more often and SEN teachers less often than expected only one assessment practice.
- Most class teachers used qualitative assessment as their only practice.
- When the class teachers assessed students using two types of practices, they were usually either CBM or tests combined with qualitative assessment.
- More than half of the SEN teachers relied on two types of assessment practices, most commonly tests combined with CBM.
- Nearly 90% of the SEN teachers used tests in their assessment.
- Associations between teachers' ratings and the reading test scores were moderate in both samples.
- In the JLD sample, the sensitivity of class teacher ratings in letter knowledge was 31% and specificity was 90%, meaning that 69% of the at-risk students remained

unidentified, and 10% of the students with no difficulties were falsely identified as at-risk.

- In phoneme identification, the sensitivity rate was 17%, and the specificity rate was 93%.
- In phoneme blending, the sensitivity rate was 46%, and the specificity rate was 70%.
- The results indicate that it was highly challenging for the class teachers to identify the difficulties.
- The SEN teachers' ratings of students' letter knowledge were associated with students' categorical letter knowledge test scores.
- The sensitivity of SEN teacher rating in letter knowledge was 55%, and specificity rate was 83%.
- In phoneme identification, the sensitivity rate was 43%, and the specificity rate was 84%.
- In phoneme blending, the sensitivity rate was 72%, and the specificity rate was 54%.
- These results show that it was also challenging for the SEN teachers to identify at-risk students who had difficulties with phonological skills.
- Regarding the First Steps sample, the results first showed that the sensitivity of the SEN teacher ratings for letter knowledge was 100%, and the specificity rate was 23%.
- The sensitivity of teacher ratings for phoneme blending was 100%, whereas specificity was only 9%.



## Conclusions

- The results first showed that the class teachers mostly



# Orthographies

eTale 2022



The aim of the study was to analyse literacy instruction activities and their association with the reading performance of first graders in Estonia and Finland, two countries that have similar orthographies and education systems but differ in the onset of formal reading instruction. The results showed that there were more similarities than differences between the countries in literacy instruction activities. The results highlight the importance of responsiveness to students' needs in early school years literacy instruction.

**Authors: Jenni Ruotsalainen, Piret Soodla, Eija Räikkönen, Anna-Maija Poikkeus, Eve Kikas & Marja-Kristiina Lerkkanen**

Source: Ruotsalainen, J., Soodla, P., Räikkönen, E., Poikkeus, A.-M., Kikas, E. & Lerkkanen, M.-K. (2020). Literacy instruction activities and their associations with first graders' reading performance in two transparent orthographies. *Compare: A Journal of Comparative and International Education*, DOI: 10.1080/03057925.2020.1742093

The aim of the study was to analyse literacy instruction activities and their association with the reading performance of first graders in Estonia and Finland, two countries with similar orthographies and education systems but who differ in the onset of formal reading instruction. The results showed that there were more similarities than differences between the countries in literacy instruction activities. However, the

slopes of reading performance development among Finnish beginning readers sharply differed from those of 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.

- Reading proficiency requires the development of both decoding and comprehension skills as well as instructional practices that address both.
- Estonia and Finland have languages with transparent orthographies, and in both countries, students enter school at the age of seven.
- Their difference is that the onset of formal reading instruction takes place in kindergarten in Estonia but in first grade in Finland.
- Despite 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.
- Instruction in first grade has been shown to have a greater impact on students' reading skills than instruction in other grade levels.
- 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.
- Yet, analyses of the effects of specific instructional practices at these differentiated levels from classroom observations are rare.

### **Emerging literacy skills**

- The Simple View of Reading (SVR; Gough and Tunmer, 1986), a widely used theoretical account on reading, suggests that reading comprehension is a composition of efficient decoding skills and linguistic comprehension.

- 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 limited number of letter-sound combinations and the alphabetic principle.
- Typically, in transparent orthographies the acquisition of decoding skill takes place soon after reading instruction has begun.

### **Literacy instruction in first grade**

- 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 reading skills.
- A heavier emphasis on 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.
- The three dimensions of framework and observational coding scheme of literacy instruction:
  1. Context (e.g. whole vs. small group instruction)
  2. Management (e.g. teacher vs. child managed direction of attention)
  3. Content of instruction
    - The present study centres on the content of literacy instruction.
    - CF activities aim at providing support for early decoding and spelling skills, such as blending phonemes or doing spelling exercises, and later practicing reading fluency.
    - MF activities seek to support students' comprehension skills via meaning-based discussions and reading comprehension tasks, for example.

- Because the Estonian and Finnish languages have 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 toward full mastery of accurate decoding are relatively easy for beginning readers.



## **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.

Research questions:

1. How is literacy instruction implemented in the observed Estonian and Finnish classrooms in first grade spring?
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?

**The participants** consisted of 33 classroom teachers (21 from Estonia, 12 from Finland) and a total of 569 students from 33 first grade classrooms. Observations in the classrooms were carried out in first grade spring (April). The literacy lessons were coded with respect to the duration of the contents of instructional activities following the Individualising Student Instruction (ISI) classroom

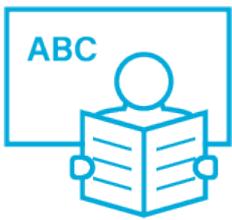
observation system developed by Connor et al. (2009). The codings assigned in each category were summarised under the broader categories of CF and MF activities and non-instructional activities. Students' reading skills were assessed using group-administered tests in the classrooms in first grade autumn (reading fluency) and first grade spring (reading fluency and reading comprehension).



## Findings

- 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 ( $M = 22.10\%$ ,  $SD = 15.64\%$ ).
- Listening and reading comprehension was observed more in Estonia than in Finland.
- Individualised work was observed solely in Finland.
- Students' reading fluency and reading comprehension showed moderate to strong correlations at within level and in Estonia also at between level.
- In Finland, an especially strong correlation was found between the amount of CF activities in the observed literacy lessons and students' reading fluency in first grade spring.
- At the within level, students' reading fluency and reading comprehension were significantly associated with each other.
- In Estonia, the amount of CF or MF instruction was not associated with the students' level of reading fluency.

- In the Finnish sample, the amount of both CF and MF activities was associated with the students' level of reading fluency: a high amount of CF activities and a low amount of MF activities were associated with a higher level of reading fluency among the students.
- 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: the Finnish beginning readers tended to have better reading comprehension if they were exposed to high rather than low amounts of CF activities.
- The Finnish beginning readers' reading comprehension tended to be poor if they were exposed to a high amount of MF activities.



## Conclusions

- More similarities than differences in literacy instruction between Estonia and Finland were found, but the analyses of the associations with students' reading performance revealed some country-specific interaction effects.
- Estonian teachers spend more classroom time on listening and reading comprehension activities.
- 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.
- The amount of either CF or MF activities did not

associate with the level of reading fluency or comprehension among Estonian students, nor did it have any additional effect on students' first grade spring performance when students' entry-level reading fluency was considered.

- Among Finnish students, a high amount of CF activities was associated with higher levels of reading fluency and better reading comprehension among students with low entry-level reading fluency.
- Overall, students spent more time on MF activities than on CF activities in 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.
- In early years literacy instruction, students need ample support and exposure to literacy content and instruction adapted to their skill levels.
- This is especially important for readers with low reading fluency skill, who thus need more support with coding skills.

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# **Is Bilingualism Associated with Enhanced Executive Functioning in Adults: A Meta-Analytic Review**



The authors synthesized comparisons of bilinguals' and monolinguals' performance in six executive domains using 891 effects size from 152 studies on adults. Before correcting estimates for observed publication bias, our analyses revealed a small bilingual advantage for inhibition, shifting, and working memory, but not for monitoring or attention. No evidence for a bilingual advantage remained after correcting for bias.

**Authors: Minna Lehtonen, Anna Soveri, Aini Laine, Janica Järvenpää, Angela de Bruin & Jan Antfolk**

Source: Lehtonen, M., Soveri, A., Laine, A., Järvenpää, J., de Bruin, A. & Antfolk, J. (2018). Is bilingualism associated with enhanced executive functioning in adults? A meta-analytic review. *Psychological Bulletin*, 144(4), 394-425, DOI: <https://doi.org/10.1037/bul0000142>

The authors synthesized comparisons of bilinguals' and monolinguals' performance in six executive domains using 891 effects size from 152 studies on adults. Before correcting estimates for observed publication bias, our analyses revealed a small bilingual advantage for inhibition, shifting, and working memory, but not for monitoring or attention. No evidence for a bilingual advantage remained after correcting for bias. For verbal fluency, the analyses indicated a small bilingual disadvantage. The available evidence does not provide systematic support for that bilingualism is associated with benefits in cognitive control functions in adults.

- Executive functions (EF) is an umbrella term for high-level cognitive control functions that are involved in

all complex mental activities, and therefore are of particular importance to human behaviour.

- The most frequently postulated EF components are working memory, inhibition, and set shifting.
- The field has not reached consensus on the nature and extent of the putative bilingual advantage.
- Theoretically, the bilingual advantage is assumed to stem from the demands that the use of two languages places on the cognitive control system.
- Previous meta-analysis and systematic reviews on the relationship between bilingualism and particular aspects of EF have reported varying results.



## **The study**

In this meta-analysis, the currently available literature on bilingualism and EF in adults was reviewed. Compared to previous systematic reviews, this meta-analysis is considerably more wide-ranging in the number of included studies and in the domains, tasks, and background variables investigated, and unpublished studies were included.

Research questions:

1. In which EF domain do we observe a bilingual advantage?
2. Are possible advantages specific to some task paradigms?
3. Are possible advantages of different magnitude in verbal or nonverbal tasks?
4. Are observed advantages affected by how participant groups have been matched for age, SES, vocabulary knowledge, or IQ?
5. Is there a larger advantage in older than younger bilingual adults?

6. Does age of acquisition (AoA) or proficiency in L2 or immigration status moderate the advantages?
7. Does the country in which the study was conducted or language pairs of the bilinguals moderate the effects?

**The data** included a total of 891 effect sizes from 152 studies.

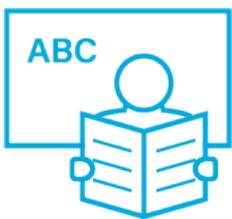


## Findings

- Before corrections, a small positive effect size in favour of bilingual groups was found,  $g = 0.06$  [0.01, 0.10],  $p < .05$ , QE [868] = 2,139.79.
- After corrections, the corrected effect size was negative,  $g = -0.08$  [-0.17, 0.01],  $p = .099$ , but not statistically significant.
- Cognitive domain was found to moderate the outcomes.
- The moderator analysis indicated a small bilingual advantage for inhibition, shifting, and WM, and a small bilingual disadvantage for verbal fluency.
- For monitoring and attention, the analysis indicated neither an advantage nor a disadvantage.
- After correction of the analysis, statistically significant negative outcomes were found for attention and verbal fluency. Other outcomes were not statistically significant.
- Whether the task was verbal or nonverbal moderated the outcomes in three domains: monitoring, shifting, and WM. The effect sizes were larger in nonverbal tasks.
- When analyses were performed only with data including tasks performed in the L1 of the bilinguals; the overall bilingual advantage was small and not statistically

significant,  $g = 0.07 [-0.05, 0.18]$ ,  $p = .276$ , QE [108] = 336.90.

- For studies matching for vocabulary size, the previously estimated bilingual disadvantage for verbal fluency disappeared.
- For studies matching for intelligence and those matching for age, the estimated positive effect sizes in inhibition and shifting were slightly larger than previously.
- Samples with later acquisition of L2 showed a smaller difference between monolinguals and bilinguals in WM,  $g = 0.02 [-0.09, 0.12]$ ,  $p = .735$ , compared to samples with early acquisition,  $g = 0.23 [0.07, 0.39]$ ,  $p < .01$ . However, analysis corrected the outcome for early acquisition toward null,  $0.02 [-0.26, 0.29]$ ,  $p = .912$ .
- L2 language proficiency or immigrant status did not moderate any of the results.



## Conclusions

- No systematic evidence was found of a bilingual advantage in adults in any of the EF domains after correcting for an observed publication bias.
- More specifically, the initial analysis across all EF domains estimated a small positive difference in favour of bilinguals, corresponding to less than 1% of the explained variation in outcomes, and this difference was the likely result of bias that remained in the data after removing outliers.
- After correcting for the remaining bias, the analysis

across all EF domains no longer estimated any difference between monolinguals and bilinguals.

- Before accounting for bias in the data, the analysis focusing on each EF domain separately estimated small differences in favour of bilinguals for inhibitory control, shifting, and WM, and a small difference in favour of monolinguals was estimated for verbal fluency.
- After correcting for bias, no bilingual advantages were seen in any of the investigated EF domains.
- In fact, only a small bilingual disadvantage for verbal fluency and a smaller bilingual disadvantage for attention remained.

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# Bilingualism and Working Memory Capacity: A Comprehensive Meta-analysis

eTale 2022



A comprehensive meta-analysis on the effects of bilingualism on working memory (WM) capacity was conducted. Results from 88 effect sizes, 27 independent studies, and 2,901 participants revealed a small to medium population effect size of 0.20 in favour of greater WM capacity for bilinguals than

monolinguals.

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A comprehensive meta-analysis on the effects of bilingualism on working memory (WM) capacity was conducted. Results from 88 effect sizes, 27 independent studies, and 2,901 participants revealed a small to medium population effect size of 0.20 in favour of greater WM capacity for bilinguals than monolinguals. This suggests that experience managing two languages that compete for selection results in greater WM capacity over time. Moderator analyses revealed that the largest effects were observed in children than in other age groups. In addition, whether the task was performed in the first (L1) or second (L2) language for bilinguals moderated the effect size of the bilingual advantage.

- Bilingualism has been associated with the enhancement of multiple executive functions (EFs), including cognitive flexibility, efficiency, task-switching, and conflict resolution.
- This is believed to be the result of lifelong experience managing multiple languages that compete for selection.
- Substantial evidence exists that both languages are activated in the bilingual brain even when only one language is being used.
- Managing languages that compete for selection requires resources from WM, and continual use of WM resources might lead to enhanced WM capacity over time in order to ensure the efficiency of processing in the future.
- Recent models of WM share the view that it is constructed of multiple component processes that rely heavily on selective attention.

- Learning a second language across the lifespan necessarily involves selective and sustained attention that operate on perceptual and long-term memory information.



## The study

The present study performed a comprehensive meta-analysis on the effects of bilingualism on working memory capacity to reveal an estimate of the population effect size. Furthermore, the authors were able to examine age, the linguistic nature of the task, and the language in which the task was performed as potential moderating variables.

**The data** included a total of 88 effect sizes from 27 independent studies with a total sample involving 2,901 participants.

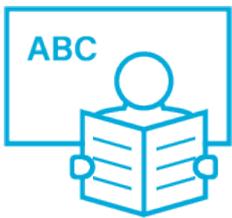


## Findings

- The weighted mean population estimate was significant,  $p = 0.20$ ,  $X^2(1, N = 88) = 799.65$ ,  $p < 0.001$ ; the 95% confidence interval was  $-0.253$  (lower) to  $0.653$  (upper).
- Age moderated the findings, but type of task did not.
- The effect of age is explained by the finding that children ( $p = 0.25$ ) showed larger effect sizes than young adults ( $p = 0.03$ ;  $t(5,411) = 3.56$ ,  $p = 0.001$ ) and

older adults ( $p = 0.08$ ;  $t(271) = 2.32$ ,  $p = 0.03$ ).

- The analysis also revealed a significant moderating effect of whether the verbal tests were performed in the L1 or L2 for bilinguals on the population effect size,  $X^2(1, N = 46) = 12.00$ ,  $p = 0.001$ .
- This is explained by the finding that when bilinguals did the WM task in their L1 ( $p = 0.28$ ;  $N = 35$ ) the effect size was much larger than when they did the task in their L2 ( $p = -0.11$ ;  $N = 11$ ), which was in the opposite direction.



## Conclusions

- The authors propose that second language experience has a positive effect on WM capacity.
- The bilingual advantage appeared to be strongest in children.
- When bilinguals performed the task in their L1, they performed better than monolinguals, but when they performed the task in their L2, they performed worse than monolinguals.
- This exemplifies the importance of ensuring that both groups are performing the task in their dominant language.