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Accuracy of special education teachers' ratings of reading

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Aim of the study

- To investigate to what extent the SEN teachers' ratings of the students pre-reading and reading skills corresponded to the students' test scores of reading in Grades 1 and 6.

Photos: <https://unsplash.com/>





Context

- Finnish mainstream school education
 - Children start primary education at **7 years** of age.
- The participants from the First Steps follow-up study (Grades 1 & Grade 6, cross-sectional data) (Lerkkanen et al., 2006)
- Finnish is a **transparent** language, having symmetrical grapheme-phoneme correspondencies (Aro, 2017).
- Special educational needs (SEN) teachers, providing **part-time special education**
 - Master's Degree
 - trained to evaluate students' reading skills and reading difficulties (RD), the need for support, and provide support





Background for the study

- In Finland current legislation (2010) obligates schools to provide every student the needed support
- The eligibility for learning support is concluded multi-professionally (no diagnosis needed)
 - Decisions are based on classroom teachers', **SEN teachers'**, and parents' **observations & views**
- No national assessments are used in Finland
- Only **one standardized test** for assessing difficulties in reading across Grades 1 to 6 (ALLU)





What does assessment accuracy mean?

- True positive (TP): according to test performance and teacher, student has a difficulty in reading
- False positive (FP): student has been rated by teacher as having a difficulty in reading, in spite of typical test performance
- True negative (TN): according to test performance and teacher, student has no or very little difficulty in reading
- False negative (FN): student has been rated by teacher as not having a difficulty in reading, in spite of poor test performance

Sensitivity and specificity (Compton et al., 2010)

- Sensitivity = how accurately struggling students are identified
 - Recommended level of sensitivity $\geq 90\%$
- Specificity = how accurately typically performing students are identified
 - Recommended level of specificity $\geq 80\%$



What was assessed by SEN teachers?

The participating students belonged to a group of **individually followed students** (n = 598) of the follow-up study, and they had received part-time special education during Grade 1 or 6.

Grade 1: ratings of pre-reading skills

- Letter knowledge
- Phonological awareness: Phoneme blending

Grade 6: ratings of reading subskills

- Reading fluency
- Reading comprehension



Method: Samples and measures

- **Grade 1:**
 - 34 SEN teachers, 69 students
 - SEN teachers' questionnaires, SEN teachers' student ratings (3-point scale)
 - Letter naming task, Phoneme blending task
- **Grade 6:**
 - 29 SEN teachers, 55 students
 - SEN teachers' questionnaires, SEN teachers' student ratings (3-point scale)
 - Reading fluency tasks (2), Reading comprehension task



Method: Analyses

- Non-parametric Spearman's rank order correlation coefficient
- **Binary logistic regression** analyses, dichotomized categories (= 2 categories)
 - SEN teacher ratings, originally 3-point scales: Clear + Mild difficulty categories were merged (→ student **has a difficulty**), or **No difficulty**
 - Dependent variables (test scores), independent variables (SEN teacher ratings)
- Tests: cut-off score for poor performance was set to 15th percentile (Grade 1), and to 16th percentile (Grade 6).



Results: Correlations between the SEN teacher ratings and test scores

Reading sub-skill assessed	Grade 1	Grade 6
Letter knowledge	0.50**	
Phoneme blending	0.29*	
Reading fluency	-	.39*
Reading comprehension	-	.24*

Note. Correlation: ** $p \leq .01$; * = $p \leq .05$

- Associations were significant and positive
- Correlations were mostly moderate



Identification accuracy of students at risk for RD based on SEN teacher ratings and test scores, Grade 1

Pre-reading skill (n = 69, number of students rated by SEN teacher)	Sensitivity %	Specificity %	True Positives %	False Positives %	True Negatives %	False Negatives %
Letter knowledge	100	23	38	48	14	0
Phoneme blending	100	9	35	60	5	0

Note. Sensitivity = $TP / (TP + FN)$; specificity = $TN / (TN + FP)$



Identification accuracy of students' reading sub-skills based on SEN teacher ratings and test scores, Grade 6

Reading skill assessed (number of students)	Sensitivity %	Specificity %	True Positives %	False Positives %	True Negatives %	False Negatives %
Reading fluency (n = 55)	63	69	18	22	49	11
Reading comprehension (n = 54)	70	20	13	64	17	6

Note. Sensitivity = $TP / (TP + FN)$; specificity = $TN / (TN + FP)$



Discussion 1/2

- Mainly qualitative assessment practices (Virinkoski et al., 2018; 2020).
 - Prior studies have shown that using solely qualitative practices can lead to inaccurate assessments.
- Most SEN teachers used multiple assessment practices simultaneously.
 - However, the assessments of especially typically achieving students were inaccurate.
 - Prior studies indicate that typically performing students have been identified more accurately than struggling students (Meissel et al., 2017).
- Teachers' rating scales (1, 2, 3) may have been incompatible with the tests.
 - Different scales (continuous vs. nominal scales), no cut-off scores in teachers' ratings.
- In **Grade 1** teachers may have taken into account also only minor difficulties in pre-reading skills, "just in case" (→ high rate of false positives).
 - Making sure that the skills develop typically, by providing support at the beginning of school.



Discussion 2/2

- Being identified as having the risk for RD in the early grades can be rather **stable** because of inadequate follow-up of the skill development.
- In **Grade 6** both sensitivity and specificity levels did not reach the recommended levels.
 - Poor levels of true positives and false negatives are alarming.
 - In Finnish, persistent difficulties in reading appear in **reading fluency** instead of accuracy.
 - Also in Grade 6, assessment accuracy of typically performing students was rather low.
- Providing support to students that perform according to expectations is unwise for the support resources are limited and should be targeted to students having the risk for RD or already manifesting signs of RD.
- This calls for more accurate assessment tools and regular monitoring of the development of the skills across primary school.



Conclusions

- In Finland multiprofessional co-operation, and collaboration with teachers and parents is the basis of evaluating students' need for support.
 - It is important to identify students having difficulties in learning to read as early as possible and to provide support as soon as possible.
- To better the accuracy of the reading assessments during primary school, teachers need to get appropriate tools, including standardized achievement tests.
- Monitoring the skill development is important!
- Future challenge: Also immigrant students' reading tests need to be developed.



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Thank very much you for your time!



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