Key literacy skills for primary school pupils – diagnostic battery

Anna Kucharská, Klára Špačková, Gabriela Seidlová Málková, Hana Sotáková, Pavla Presslerová, Olga Kučerová

Department of Psychology, Faculty of Education, Charles University, Prague anna.kucharska@pedf.cuni.cz, klara.spackova@pedf.cuni.cz, gabriela.malkova@pedf.cuni.cz, hana.sotakova@pedf.cuni.cz, pavla.presslerova@pedf.cuni.cz, olga.kucerova@pedf.cuni.cz

Introduction

Professionals in the counselling system in education – psychologists and special education teachers working in educational counselling facilities (pedagogical and psychological counselling centres, special education centres) and at schools (school psychologists, special education teachers) – deal with providing support to pupils with literacy difficulties, i.e. a broad group of pupils (specific learning disorders, speech and language disorders, socio-cultural disadvantage, disabled pupils, foreigners, gifted pupils, etc.). A diagnostic approach that seeks the causes of difficulties in reading and writing and provides information about the strengths and weaknesses of the child is the basis for the recommendations for interventions at school and in the home environment

Though assessment of reading literacy has a long tradition in the Czech Republic (e.g. Matějček et al., 1987, Caravolas, & Volín, 2005, Seidlová Málková & Caravolas, 2017), the presence of standardised reading measures is very limited, especially when it comes to the (reading comprehension. The available tools either measure comprehension on the sentence level or are designed to assess comprehension of a narrative text based on retelling a story.

The ongoing investigation of the TAČR (Technology Agency of the Czech Republic) project aims to respond to the limits of current psychodiagnostic testing and develop a new diagnostic battery of literacy skills. We build on current trends in the foreign literature (e.g. Gough & Tunmer, 1986; Keenan et al., 2008) and bring new approaches to evaluate different forms of comprehension which contribute to the development of functional literacy from the developmental perspective. The new comprehensive battery, therefore, includes a variety of tools measuring decoding and reading-related skills as well as text comprehension skills. Comprehension is assessed on different levels (explicit, implicit, and interpretative) and under several conditions: filling in missing words to the text, answering questions after oral/silent reading or listening to narrative/exploratory texts. The battery also includes questionnaires for children, parents and teachers to enable the examiner to map the socio-environmental and motivational factors (Kucharská, & Špačková, 2018).

Results

Table 3. Results of reliability analysis (using Cronbach's alpha) for selected

comprehension tasks					Construct	Grade	Name of the task	N	α	N of items		
							Decoding abilities	1	Reading words	152	0,990	46
Construct	Grade	Name of the task	N	α	α	N Of		2		202	0,920	46
			T1/T2	T1	Т2	items		3		213	0,738	46
Oral reading	1	Getting ready for the trip	-/132					4		193	0,581	46
comprehension		- text comprehension		-	0,592	17		5		147	0,468	46
							Language abilities	1	Lingustic awareness	119	0,721	48
		 vocabulary task 		-	0,610	10	(morphology and w	ord 2	test	198	0,775	48
Silent reading	1	Snowman	- /135				formation)	C		212	0 901	10
comprehension		- text comprehension		-	0,820	15	iormation	5		212	0,801	40
		 vocabulary task 		-	0,860	10		4		196	0,768	48
	2-3	Big friends	383/299					5		148	0,830	48
		 text comprehension 		0,664	0,680	17		c 1. 1. 1.				
		 vocabulary task 		0,824	0,826	10	lable 5. Results o	of reliability ana	lysis (using Cronbach's alp	ha) for reader	s' self-co	ncept and
	4-5	A trip to Korenov					environmental fa	ctors at T1				
		 text comprehension 	330/325	0,546	0,469	17	-					
		 vocabulary task 		0,602	0,570	10	Construct	Grade N	Name of the Questionnaire	N	α	N of
Listening	1	Forest elves	237									items
comprehension		 text comprehension 		0,7	0,728		Readers's self	2 F	Reader's self-concept assessme	nt 196	0,803	16
		 vocabulary tasks 		0,7	'19		concept	3	scale	209	0,736	16
			400/404	0.047	0.600	10	and	4		187	0.858	20
Cloze tests	2	Io the yard!	199/181	0,647	0,639	10	environmental	5		140	0.885	 20
	3	The bealt a burners's friend	210/189	0,559	0,542	10	factors		Juestionnaire for teachers	127	0 9/16	20
	4	The book – a numen's friend	196/194	0,413	0,515	10		1_5 C	Juestionnaire for parents	202		20 20
	5		148/156	0,463	0,416	10		1-5 (093	0,705	20

References

Caravolas, M., & Volín, J. (2005). Baterie diagnostických testů gramotnostních dovedností pro žáky 2. až 5. ročníků ZŠ [Set of diagnostic tests of literacy skills for students of the 2nd-5th grades]. Praha: IPPP ČR.

Kucharská, A. (2014). Riziko dyslexie: Pregramotnostní schopnosti a dovednosti a rozvoj gramotnosti v rizikových skupinách. [Risk of *dyslexia. Preliteracy skills and abilities and literacy development in at-risk groups].* Praha: PedF UK. Kucharská, A. et al. (2015). Porozumění čtenému III. Typický vývoj porozumění čtenému – metodologie, výsledky a interpretace

Context of Czech language and school environment

The Czech language is a Slavonic language with rather high grapheme-to-phoneme correspondence. Reading instruction is not a part of the preschool curriculum. Children are exposed to the written language, but the teaching instruction does not start till the 1st grade of elementary school. Even if there are many reading instruction methods, the two prevailing ones are – the analytic-synthetical method and the genetic method. Both methods are classified as phonic methods.

75 % of Czech schools use the analytic-synthetical method as their main reading instruction method. This method has been used in the Czech Republic for decades. It is based on the training of grapheme-phoneme correspondence, alphabet acquisition, syllable composition and syllable reading.

The genetic method is used in 20 % of Czech schools. In the genetic method, children are not trained to syllable reading. After learning selected phoneme-grapheme correspondences, children immediately start reading whole words. From the start, great emphasis is placed on text comprehension (for more, see, e.g. Kucharská et al., 2015).

	EXPLICIT COMPREHENSION	Table 1. Princip
1	recalling of details from the text	comprehension
2	phonological distractor	
3	semantic distractor	
4	protagonist/main plot vs supporting characters/plot OR main/minor detail	
5	plotline	10000
	IMPLICIT COMPREHENSION	
6	factual judgment	and the second
7	semantic judgment of unknown words, sentence coherence	
8	emotional, personal judgment (why they do that, what they feel)	
9	motivation of protagonists	1000
10	pragmatic judgment (metaphors, proverbs)	2000
	INTERPRETATION OF TEXT, CONNECTION TO EVERYDAY LIFE	1111
11	the main message of the text	
12	transfer to life, general interest in health (good relationships, morals)	
13	alternative procedure – what could have been done differently?	
14	who else could have contributed?	
15	interpretation of behaviour, emotions, consequences	[www.

Table 4. Results of reliability analysis (using Cronbach's alpha) for selected for decoding and reading-related measures at T1

výzkumu. [Reading Comprehension III. Typical Reading Comprehension Development – methodology, results and interpretation of the research.] Praha, UK PedF.

Kucharská, A., & Špačková, K. (2018). Key Literacy Skills for Primary School Pupils – Diagnostic Battery. Gramotnost, pregramotnost a vzdělávání, 2, 3, 71—74.

Kucharská A., Seidlová Málková G., & Špačková K. (2015). Porozumění čtenému – vývojová dynamika a jeho předpoklady. In Porozumění čtenému III. Typický vývoj porozumění čtenému - metodologie, výsledky a interpretace výzkumu. [Reading Comprehension III. Typical *Reading Comprehension Development – methodology, results and interpretation of the research.*] Praha: UK PedF, 85-126.







Methodology

FACULTY

OF EDUCATION

Charles University



istockphoto.com/LisaValder]

Methods - diagnostics battery

When designing the tools, we build on the tools developed in the GAČR project P407/13-20678S Reading comprehension – typical development and its risks (for more information, see Kucharská et al. 2015). For the validation of the results, subtests from standardised cognitive test WISC- III (Krejčířová, Boschek, & Dan, 2002) and standardised reading and writing tests were used (Caravolas & Volín, 2005). The battery was administered in two testing times i three sessions: T1 fall 2018, T2 spring 2019.

Participants

- account.
- Bohemian Region (application partner).
- declared their agreement to the participation of pupils (informed consent). All data were anonymised.

Table 2.
Participants
details (T1)

Research group	Number of schools	Grade	Number of students	Mean Age (months)	Gender M/F (%)	Reading instruction method AS/GE/others* (%)
Α	11	1	153	81,6	47/53	84/16/0
В	24	2	206	94,0	48/52	79/14/7
		3	220	105,2	40/60	69/31/0
С	20	4	198	117,8	40/60	64/36/0
		5	152	12,2	48/52	73/27
*AS analytic-	-synthetic m	ethod, GE	E genetic m	ethod		

Discussion and conclusion

In most cases (table 3-5), Cronbach's alpha coefficient reached acceptable values (above 0.7). Our data show a trend in a pattern of psychometric characters of analysed measures: the lower the grade, the higher the value of the coefficient. Generally, we can find the lowest values (0.5-0.6) in new comprehension tasks. Since some comprehension questions are more related to reading skills, others to cognitive or language skills, and others even to the reader's background knowledge, we can doubt that all questions should correlate together. This analysis was, therefore, informative for us. We are going to test the reliability by other methods. In some cases, we are considering items deletion.

All tests will be presented in the Test manual with descriptive statistics (min., max., mean, median, standard deviation). Norm-referenced scores are created for T1 / T2 and are reported as a percentile ranking, standard scores, confidence interval and developmental scores (age equivalent scores and/or grade equivalent scores).

The battery will be distributed via training events at the Educational Counselling Centre of the Central Bohemian Region. The one-day training will be arranged in which the theoretical background, administration, evaluation, and interpretation of individual tests in relation to the target population of poor readers will be explained. To prevent misuse, the battery will not be available without this training.

The new battery will be used for the diagnosis of literacy difficulties (reading difficulties) of pupils at primary schools, which is the most frequent problem needing to be solved in the counselling system. These tools are necessary for the school environment since pupils with reading difficulties account for up to 85 % of pupils with special educational needs. We hope this new standardised material will not only help to refine the diagnostic process of poor literacy but will also help to target the intervention better.



Dedication to the project

Application study is supported by a grant of Technology Agency of the Czech Republic, project PedF UK entitled Klíčové gramotnostní dovednosti u žáků základních škol - testová diagnostická baterie, č. TL01000365 (2018-2021), Key literacy skills for primary school pupils – diagnostic battery, viz pages.pedf.cuni.cz/diagnostika_cteni

The 32th International Congress of Psychology, Prague 2020, Czech Republic **Poster ID #6734**

	Phonological skills
	Tests of phoneme awareness
5	 Pseudowords repetition task
5	Linguistic awareness test (assessing morphology, word formation, and sentence comprehension)
,	Decoding tests
ו	Word reading test
,	Pseudoword reading test
k	Comprehension tasks
	 Listening comprehension test
ו	 Oral reading comprehension tests
	 Silent reading comprehension tests
	Cloze tests
	Reader's self-concept assessment scale
	Environmental factors questionnaires (Questionnaire for
	teachers, Questionnaire for parents

• Monolingual Czech speaking pupils (no sensory, neurological impairment) of primary school tested (N=929 for T1). Participants divided into three research groups: A (grade 1), B (grade 2-3), C (grade 4-5), aged 6-12 years. Representative sample – pupils from schools all over the Czech Republic, divided according to socio-economic factors (unemployment) into 10 clusters, size of schools and used reading instruction methods taken into

Recruitment realised in cooperation with the Pedagogical and Psychological Counselling Centre of the Central

• The principles of ethical data processing followed in the research; the head of the school and then the parents



Graph 1. Example of norming procedure of Linguistic awareness test – dependence of arithmetic averages of the IRT of the total score on age categories (T1 Autumn 2018, T2 **Spring 2019**)