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Assessment of prereading competence

Abstract: In order to better cope with learning difficulties in the area of reading, early treatment and consequently, early detection of deficiency is important. This research is concerned with the design of an instrument with which to detect children with less-developed prereading competence. The theoretical background presents various factors affecting reading efficiency (prereading competence) that are required in learning to read. These are: visual discrimination, phonological awareness, rapid automatic naming, short-term memory, vocabulary, and comprehension. In Slovenia we do not have a standardized instrument that assesses prereading competence in the areas that are mentioned above. We designed a battery of tests that assesses prereading competence based on well-established foreign and Slovenian instruments or tools. A sample of 84 children aged 5 to 7 years were tested. The research confirms that children in their first year of primary school have a better developed prereading competence than preschool children. The survey also confirms that there is no significant difference between boys and girls in the development of prereading competence. The results show that the designed instrument enables identification of children who are at risk of developing reading disorders.

Keywords: prereading competence, reading disorder, early detection.

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Introduction

Reading is one of the basic communication skills of every person. In an individual's life, many things depend upon the level of development of this skill. This is especially interesting for professionals in educational institutions, since pupil's problems in the area of reading, especially in higher classrooms of primary school, make it difficult to progress in all areas. Because of learning difficulties in the area of reading, the young as well as adults don't achieve the level of literacy that would enable them educational success and employment opportunities in accordance with their intellectual and other abilities (Lundahal 2011).

Research has shown that different abilities acquired during preschool or the prereading period are in close connection with later reading success. Problems in the early stages of reading are more easily managed. Strategies to overcome the difficulties are more efficient, and the child does not have secondary problems (lack of motivation and interest, misunderstanding in other school subjects, a decline in academic success...), that make general progress difficult. (Knalec 2010). School professionals try to detect pupils with learning difficulties, but practice shows that we do not have systematic and standardized instruments to do so. In Slovenia, we do not have a standardized instrument that assesses prereading competence. Many children who have problems in the early stages of learning to read stay undiscovered, and they do not get the systematic assistance that is needed. Our research tries to contribute to solving this problem.

Stages of reading development

Reading develops as we live. Assimilating the skill of reading is a long process that starts with developing prereading competence, and leads to independent reading for learning. In the literature, we find different views on the development of reading and the reading process. We particularly point out the developmental theory of reading author J. Chall, which is pertinent mainly because it is entirely

consistent with stages of instruction. Chall used Piaget's theory of cognitive development in designing the stages of reading development. Reading stages follow in a logical order. None of them can be skipped. Progress depends on cognitive development and the impact of the environment. The model contains six stages of reading development (Chall in Pečjak et al. 1999):

– Stage 0: Prereading stage (preparation for reading) covers from birth up to 6 years of age. This stage takes a long time, and it is the time of the greatest changes. During this period, children learn about different aspects of language, semantic and syntactic, as well as acquire knowledge about the nature of words. They realize that some words sound the same at the beginning or the end, that spoken words can be broken into parts, and that the parts can be put together to form whole words. Most children also acquire some knowledge of print at this stage; they learn the names of the letters of the alphabet and learn to print their names; most children learn to hold the book right-side up and turn the pages (Carnine et al. 2007). At this stage, children develop all competences that they need to start learning to read. Especially, two of them are important: visual and auditory perception (Zrimšek 2003).
– Stage 1: This is the period of initial reading and decoding, which lasts between 6 and 7 years of age. At this stage, children learn the letters of the alphabet and the correspondence between the letters and the sounds that they represent. According to author J. Chall (in Pečjak et al. 1999) the child at this stage of development goes through three stages: At first, the child pays more attention to the shape of words than to the meaning, and he/she may say another word that fits in with the text's meaning. Then the child pays attention to graphic design and less on the word's meaning. The third phase should lead to synthesis of the first and second phases, where the child distributes his attention both on the graphic image of words and on their meaning and thus reads fluently and accurately.
– Stage 2: Fluency confirmation (fluent reading) covers the period between ages 7 and 8 years. The learner at this stage practices fast and accurate reading - reading technique. Through practice, reading becomes faster, and the child internalizes the skill of decoding – reading fluently and quickly decoding words (La Berge and Samuels in ibid.).
– Stage 3: Reading for learning covers the period between 9 and 14 years. Children become capable of obtaining new information from print. They use reading as a tool to acquire new knowledge, information, and experience. Reading becomes a fundamental tool for learning (ibid.).
– Stage 4: Achieving multiple viewpoints (identifying relationships and attitudes) lasts between years 14 and 18. Readers during this period, because of the knowledge acquired during prior education, and having achieved a higher level of cognitive development, deal with more than one set of facts and competing theories (ibid.).

– Stage 5: Construction and reconstruction (synthesis from different sources) lasts from the age of 18 and represents the mature period of reading. The main characteristic of this stage is forming knowledge from reading. The reader constructs his own knowledge through higher mental processes such as analysis, synthesis, and making judgments about what he has read (ibid.).

The three initial stages are stages of learning to read, then follows meaningful and flexible reading. Despite the fact that the stages are progressively ordered, there is a connection between them. The reading model takes into consideration perceptive as well as cognitive processes. It follows different developmental principles, and according to this, is considered a developmental process. Especially for teaching, it is important to understand reading as a process than can reach different levels of complexity and that improves by learning. From the presented model, we can see that a child cannot move on to the next reading stage without successfully assimilating previous stages. Stanovich (in Grosman 2007) coined the term "Matthew Effect" to describe the educational dilemma that students face throughout their schooling when they are expected to perform at particular levels even though they lack prerequisite knowledge and skills. Matthew Effect means that good students are becoming better and worse students even worse. Children who begin school with little or no phonemic awareness have difficulty learning letter-sound correspondences and therefore have trouble with word recognition. If a student doesn't have the necessary abilities, then he cannot read fluently, or later on, read for meaning. Unrewarding early experiences squelch motivation and lead to less involvement in reading-related activities. So exactly those students who need more training, ultimately get few reading activities. This lack of practice further delays the development of automatic word recognition. In contrast, children who develop efficient decoding processes read quickly and easily and find reading enjoyable, because they can concentrate on the meaning of the text. They read more; the additional exposure and practice further develops their reading abilities.

Prereading competence

Students must have developed different skills before learning to read, from knowing letters and awareness that speech consists of different voices, to understanding that letters represent sounds (working memory and phonemic discrimination) (Goodwin 2012). An extensive analysis of literature has also shown that phonological awareness is most strongly related to reading ability (Melby-Lervag et al. 2012). Phonological awareness has proven to be important in the form of recognition and manipulation of sound and rhymes (Walcott et al. 2010). Rapid automatic naming and phonological awareness at all times constantly affects reading, while the deletion parts of words better predict the occurrence of learning difficulties in older students (Pan and McBride-Chang 2011).

Walcott et al. (2010) have investigated the influence of attention in the preschool period on the level of development of three prereading competences (phonological awareness, letter knowledge, and rapid automatic naming) in the first class of primary school. They found that attention problems in preschool predict a lower level of phonemic awareness and letter naming one year later. Attention problems in preschool did not significantly predict a lower level in rapid automatic naming.

Before children are taught to read, they must have developed listening comprehension (Aouad and Savage 2009). By this we mean auditory perception and discrimination (Žerdin 2003). Marks and Burden (2005) argue that tests of auditory discrimination are the best predictor of reading difficulties. It is also important that auditory memory is developed. Weak auditory memory can cause difficulties in maintaining phonemes when decoding words, and children spend more cognitive sources in decoding than for understanding (Jurišić 2001). Auditory sequential memory and rhyme consistently show the best connection with reading literacy at the age of six to eight years (Marks and Burden 2005). Accurate perception and reproduction of letters or words are important for the ability of visual discrimination (Pečjak 1996). This means that the child is able to distinguish each individual character, as well as patterns or symbols (Magajna et al. 2008).

Lei et al. (2012) investigated, in a longitudinal study, early language skills in 261 children between the age of 3 and 6 years. They used tests for assessing morphological awareness, word recognition, syllable deletion, repetition of meaningless syllables, ability to construct new phrases, and rapid automatic naming. They also assessed non-verbal IQ and the mother›s level of education. Performances on these skills were then examined in relation to word reading accuracy and fluency at the age of 8 years. The results show that early language skills are essential in predicting later reading accuracy and fluency. They found that non-verbal IQ was not connected with reading ability. The education level of the mother might be an influential factor in reading outcomes, but it is not a strong predictor of reading difficulties as long as a child has adequate prereading competence. The results show that the combination of syllable deletion, ability to construct new phrases, and rapid automatic naming have the highest correlation with reading. Al-Otaibi and Fuchs (2006) noticed that children with a reading disability differ from their peers in verbal memory, vocabulary, syntactic awareness, word segmentation, speed of word naming, and verbal intelligence. Later reading achievement also influenced different aspects of language such as vocabulary, word comprehension, grammatical and syntactical awareness. The results of numerous studies suggest that the child›s knowledge of letters, print awareness, phonological awareness, and different aspects of language (such as vocabulary, word comprehension, and syntactical/grammatical awareness) are reliable and independent predictors of later reading difficulties (Loningan et al. 2011). Ziegler et al. (2010) argue that vocabulary knowledge, which is seldom recognized as a unique correlate of reading related skills, has emerged as a relatively important predictor of later reading difficulties.

A longitudinal study on a sample of 392 British children, aged 4 years and 6 months, tested the impact of early perceptual, cognitive, and motor skills on

reading development. At the beginning of schooling, this study measured their phoneme skills, rhyming skills, IQ, memory, language skills, and auditory and motor skills. The researchers again tested 348 children at 5 years and 2 months, who had stayed in the same school, with tests of letter recognition, word reading, and reading meaningless words. The results show that initial linguistic abilities, phonemic awareness, rhyme awareness, and auditory abilities have an effect on reading. Memory, IQ, motor skills, speed, and accuracy did not have a direct impact on reading (Solity and Shapiro 2008).

Language factors are even more important for reading comprehension (Verhoeven et al. 2011). Among important language factors are semantic and syntactic knowledge. Syntactic knowledge means that the individual understands the rules of connecting words in a sentence and how this contributes to the meaning of the text. Syntax also specifies the function of grammar, and through this, pronunciation and word meaning (Leu and Kinzer in Lipec Stopar 1999). All processes of semantic and syntactic analysis advance quickly with the skilled reader without effort, and reading comprehension is a result of semantic analysis in connection with syntactic knowledge. Semantic knowledge leads the reader from understanding connection between elements of the sentences to the mental presentations of these connections (Just and Carpenter in ibid.). Numerous studies also deal with the role of listening or auditory comprehension in reading comprehension (Aaron in ibid.) and show that listening comprehension is a strong predictor of reading comprehension and achievements in later stages of reading. This is even more important in advanced years of schooling.

Relevant literature shows that there are numerous risk factors for later reading difficulties. The focus is on different cognitive characteristics (visual and auditory perception, phonological awareness, working memory, processing speed, visual-spatial skills) as well as on different aspects of language (vocabulary, grammatical and syntactical awareness). Research confirms that many of the causes of reading difficulties stem from problems in prereading skills, and first indicators for learning difficulties are already noticeable in preschool age or in the first class of primary school (Fawcett et al. 1998).

Definition of research problem and aim

The aim of the empirical research is to use modified foreign and Slovenian tests that include variables related to reading, to extend them, to shorten and to upgrade, and then to test a sample of children to find the extent of development in prereading competence in children aged 5 to 7 years old. The designed instrument includes a cognitive profiling system (COPS) (Singelton et al. 1996), test of cognitive skills for preschool children (Prove di abilitá cognitive per la Scuola dell'infanzia (PAC-SI) (Scalisi et al. 2000), test of phonological awareness (Magajna 1995), Special Needs Assessment Profile (SNAP) (Weedon and Reid 2010), Acadia test of developmental abilities (Atkinson et al. 1972) and Bilingual Aphasia Test (BAT) (Paradis 1987). With our research we want to find out whether there are

differences in the development of prereading competence between boys and girls and between younger and older groups of children. In creating the test, we want to find out its usefulness, relevance, and reliability.

Methodology

Sample

The sample consists of 84 children who attend the last year of kindergarten and the first class of primary school (42 boys and 42 girls). The age of children is from 5 to 7 years (42 children aged 6 years or less and 42 children older than 6 years). In the sample, we do not include children with special needs.

Variables and used measurement instrument

Independent:
- gender,
- age.

Dependent:

Test of prereading competence includes 16 tasks to check 16 competences. The following table shows a list of dependent variables, the name of the task that verifies an individual's competence, as well as a description of the measurement.

Dependent variables	Symbols for variables	Tests	Description of the measurement
Identifying the rhymes	IDRHYM	RHYMES	Child is given four words introduced with pictures. Only one word rhymes with the middle one. Child needs to find the word. The test includes 10 examples.
Syllable synthesis	SYNSYL	SYLLABLE SYNTHESIS	With listening child puts syllables into one word and pronounces it. The test includes 10 examples, 3 words with two syllables, 4 words with three syllables and 3 words with four syllables.
Syllable analysis	ANALSYL	SYLLABLE ANALYSIS	Child divides each word on the syllables. The test includes 10 examples. 1 word has one syllable, 4 words have two syllables, 3 words have three syllables, and 2 words have four syllables.
Identifying first sound	IDFSOUND	FIRST SOUND	Child must choose from 4 pictures the one that matches in the first sound with picture presented above. The test includes 10 examples.

Phoneme discrimination	PHONDIS	PHONEME DISCRIMINATION	10 words are introduced with pictures. Then successively a fox and bear try to repeat each word. The child must tell which animal correctly repeats the presented word.
Phoneme analysis	PHONANAL	PHONEME ANALYSIS	The child must divide given words into phonemes. The test contains 10 words, 5 words with one syllable and 5 words with two syllables.
Syllable/phoneme deletion	DELSYPH	SYLLABLE/ PHONEME DELETION	We tell the child the word without meaning and tell which syllable or phoneme should be removed. The test includes 10 examples.
Visual discrimination: speed accuracy	VISDISS VISDIDA	VISUAL DISCRIMINATION	From the 84 symbols, the child must find all symbols that are identical to the given. Speed and accuracy are important in solving (how many symbols can the child process in one minute, and number of adequately resolved lines).
Short-term visual memory with visual support	STVMVS	VERBAL MEMORY	For each group of animals, we say in what order they arrived at their destination. From five animals, a child chooses the appropriate animals and places them in the appropriate order on the podium. The test comprises one series of two animals, one series of three animals, and one series of four animals.
Auditory short-term memory - digits	AUSTMD	AUDITORY MEMORY FOR DIGITS	We pronounce a certain sequence of numbers in a row and the child must repeat the sequence in the same order. The test includes 3 sequences with three numbers, 2 sequences with four numbers, and one sequence with five numbers. The test includes 6 examples.
Auditory short-term memory - sentences	AUSTMS	WORKING MEMORY	The child hears the sentences. For every sentence, there must be a reply, true or false. After a set of sentences, the last word from every sentence must be repeated in the appropriate sequence. The test includes 2 sets with 2 sentences and the same number of sets with 3 sentences.
Short-term visual memory	STVISM	VISUAL MEMORY	After being shown a specific symbol, the child needs to circle from the set of symbols the one that he saw. Difficulty increases with increasing number of symbols shown (from one to three) and the length of the set of symbols which he chooses. For every sequence there are two examples. All in all, there are 6 exercises.

Short-term visual-spatial memory	STVSM	VISUAL-SPATIAL MEMORY	Computer presentation demonstrates the route of the mouse. The child links the holes in the appropriate order. The difficulty increases with the length of the route of the mouse. At first it makes the way to only one point, then in the eighth test it goes to four points. Every stage of difficulty has two tasks.
Rapid automatic naming	RAN	RAPID NAMING	The child must find five different objects, which are in different sequences and divided into 6 rows (30 subjects which repeat many times), as quickly as possible and exactly name all subjects. Meanwhile, time is measured (in seconds).
Recalling the words on: - a certain phoneme - a certain term	REWF REWT	RECALLING WORDS	The child has 1 minute to name as many words as possible with the first letter P. In the second part, the child has one minute to name all the food he knows. Every word is scored with 1 score.
Vocabulary and word comprehension	VOCWC	BASIC VOCABULARY AND UNDERSTANDING	From four images the child must choose one that fits the sentence he heard. The test includes 10 sentences.

Table 1: Description of dependent variables

Procedure of collecting data and the processing of data

We collected data for the study from January to March 2014 in the three departments of kindergarten and in three departments of elementary school. Managers, teachers, educators, and parents of children were informed about the study and parental consent was obtained. All testing of children was held individually in two sessions (on different days), both times for about 20 minutes. Testing was implemented by a qualified person. Data was analyzed using SPSS program. We used the following statistical methods:

– Descriptive statistics to describe the sample, data display (arithmetic mean, standard deviation, minimum value, maximum value, percentiles),
– T-test to calculate statistically significant differences between the independent variables,
– Cronbach's alpha coefficient for calculating the reliability of the test.

Results and interpretation

Descriptive statistics of the sample

The table below shows some of the parameters of descriptive statistics for the dependent variables. Also calculated are arithmetic mean (M), standard deviation (SD), minimum (MIN) and maximum (MAX). Also percentile values (5^{th}, 10^{th}, 25^{th}, 50^{th} and 95^{th} percentiles) are calculated.

Variable	N	M	SD	MIN	MAX	5º	10º	25º	50º	95º
IDRHYM	84	7.51	2.51	1	10	2.00	3.50	6.00	8.00	10.00
SYNSYL	84	9.48	1.24	4	10	6.25	8.00	10.00	10.00	10.00
ANALSYL	84	7.70	2.84	0	10	1.00	3.00	6.00	9.00	10.00
IDFSOUND	84	7.13	2.96	0	10	1.00	2.50	5.00	8.00	10.00
PHONDIS	84	8.82	1.39	4	10	6.00	7.00	8.00	9.00	10.00
PHONANAL	84	5.11	4.39	0	10	0	0	0	5.50	10.00
DELSYPH	84	2.07	2.83	0	10	0	0	0	0.50	8.00
VISDISS	84	59.74	24.22	21.08	154.60	29.41	33.58	44.77	55.59	107.00
VISDIDA	84	3.71	2.43	0	7	0	0	1.00	4.00	7.00
STVMVS	84	3.90	2.06	1	6	1.00	1.00	3.00	3.00	6.00
AUSTMD	84	6.76	2.48	0	10	2.25	3.00	5.00	7.00	10.00
AUSTMS	84	1.44	2.05	0	7	0	0	0	0	7.00
STVISM	84	5.98	3.01	0	12	1.00	2.00	4.00	6.00	12.00
STVSM	84	9.01	5.11	0	20	2.00	2.00	6.00	9.00	20.00
RAN	84	44.88	13.03	21.70	92.70	29.05	30.25	34.08	43.08	70.78
REWF	84	2.85	2.94	0	10	0	0	0	2.00	9.00
REWT	84	9.61	3.92	1	20	2.50	5.00	7.00	9.00	18.00
VOCWC	84	7.74	1.35	3	10	6.00	6.00	7.00	8.00	10.00

Table 2: Some parameters of descriptive statistics for dependent variables

Table 2 shows that children tested for prereading competence best combined syllables into words, and scored worst on the test of working memory, which requests repetition of the last words from two to three sets of sentences. None of the children resolved this test fully; the average score was 1.4 points out of 10, which indicates complexity of the test for this age- group of children. Similarly, children achieved a low average score (2 points out of 10) for the test syllable/phoneme deletion. The difference was that 5% of children reached 8 points or more. The ability to remove the syllable/phoneme from a word is rarely traced in children who cannot yet read (Jurisic 2001). Recalling words of a certain phoneme has proved to be a difficult ability for children aged 5 to 7 years. Half of the children listed 2 words or less. Lyintinen (2009) argues that basic phonological awareness isn't any problem to children. However, it gets complicated where tasks require recalling words, verbal memory, or removing parts of words. In the phonetic analysis test

half of the children were above average success and the other half below average. Development of phonological awareness begins in the preschool period, but due to the abstract forms of phonemes, occurs later than visual abilities. The child first recognizes the word length (long - short), then syllables, from which the word is composed, and then phonemes in the word (Pečjak 1999). In other tests of prereading competence most children were successful.

Answers on research questions

– How many children are at risk for developing reading disorders in the tested group?

Children who fell below the 5th percentile on the individual test significantly deviate from the average results. This means that 95% of tested children were more effective than them. For some variables, the 5th percentile could not be determined due to dispersion of the data obtained (abnormal distribution). On the tests of working memory, syllable/phoneme deletion, and recalling words using certain phonemes, most children reached zero point or an extremely low result. On the test of phonetic analysis, about half of the children reached almost all the points, and the second half of the children almost no points. Four children (representing approximately 5% of the sample) fell below the 5th percentile, 1 child on three tests, and 3 children on two tests. Two girls were from the younger age groups; 1 girl was from the older age group, and 1 boy was from the younger age groups. A girl of 6 years fell below the 5th percentile in identifying rhymes, syllable synthesis, and identifying the first sound. Another girl aged 5 years 7 months fell below the 5th percentile in the phonemic discrimination test and auditory short-term memory for digits. The third girl, aged 6 years 6 months, fell below the 5th percentile on the auditory short-term memory for digits test and recalling the words on a certain term. The boy aged 5 years 4 months fell below the 5th percentile on the test of identifying rhymes and recalling the words on a certain term.

– Is there a significant difference between girls and boys in performance on individual tests of prereading competence?

Variables	GENDER	N	M	SD	T-test	α
IDRHYM	boy	42	7.14	2.52	-1.36	.18
	girl	42	7.88	2.46		
SYNSYL	boy	42	9.43	1.40	-0.35	.73
	girl	42	9.52	1.07		
ANALSYL	boy	42	7.93	2.48	.73	.47
	girl	42	7.48	3.17		

IDFSOUND	boy	42	6.50	3.15	-1.99	.05
	girl	42	7.76	2.65		
PHONDIS	boy	42	8.76	1.32	-.39	.70
	girl	42	8.88	1.47		
PHONANAL	boy	42	3.83	4.24	-2.77	.01
	girl	42	6.38	4.21		
DELSYPH	boy	42	1.67	2.51	-.32	.19
	girl	42	2.48	3.10		
VISDISS	boy	42	62.85	23.75	1.18	.24
	girl	42	56.63	24.56		
VISDIDA	boy	42	3.71	2.40	.00	1.00
	girl	42	3.71	2.49		
STVMVS	boy	42	3.74	2.01	-.74	.46
	girl	42	4.07	2.11		
AUSTMD	boy	42	6.83	2.46	.26	.79
	girl	42	6.69	2.52		
AUSTMS	boy	42	1.57	2.30	.58	.56
	girl	42	1.31	1.79		
STVISM	boy	42	5.69	2.75	-.87	.39
	girl	42	6.26	3.25		
STVSM	boy	42	10.14	5.91	2.07	0.04
	girl	42	7.88	3.96		
RAN	boy	42	43.74	10.01	-.80	.43
	girl	42	46.01	15.53		
REWF	boy	42	2.74	2.87	-.33	.74
	girl	42	2.95	3.04		
REWT	boy	42	9.81	4.03	.47	.64
	girl	42	9.40	3.85		
VOCWC	boy	42	7.74	1.29	.00	1.00
	girl	42	7.74	1.42		

Table 3: Comparison of average results according to gender and t-test for comparison between boys and girls for statistically significant differences

Boys achieved higher average values for seven variables and girls achieved higher average values for nine. Boys and girls achieved the same average result for the test of basic vocabulary and understanding. Also, on average, boys and girls equally accurately distinguished visual symbols, but boys were a bit faster. Boys were, on average, more successful on tests that measure: an analysis of syllables, auditory short-term memory for digits, auditory short-term memory for sentences, short-term visual-spatial memory, rapid automatic naming, and recalling

the words on a certain term. Girls were more successful in tests that measure: identifying the rhymes, the synthesis of syllables, identifying first sounds, phonemic discrimination, phonetic analysis, syllable/phoneme deletion, short-term auditory memory with visual support, visual short-term memory, and recalling the words using a certain phoneme. The difference between the arithmetic means of the two groups is statistically significant in the test that examines the ability of phonemic analysis. In this test, the girls reached, on average, a 2.5 points higher result. A statistically significant difference between boys and girls was also proven on the test of visual-spatial memory, in favor of boys. Comparison of results between boys and girls in the other tests of prereading competence showed that between them there is no statistically significant difference. Similar findings were reached in the survey of Christmas et al. (2007), where the differences between the gender in all the tests of phonological awareness were statistically insignificant.

– Do children aged over 6 years, on average, achieve higher scores on the individual tests than children aged 6 years or less?

Variables	AGE	N	M	SD	T-test	Risk
IDRHYM	5 to 6	42	7.07	2.67	-1.63	.108
	6.1 to 7	42	7.95	2.27		
SYNSYL	5 to 6	42	9.48	1.087	.00	1.00
	6.1 to 7	42	9.48	1.38		
ANALSYL	5 to 6	42	8.38	2.35	2.24	.03
	6.1 to 7	42	7.02	3.14		
IDFSOUND	5 to 6	42	6.02	3.08	-3.68	.00
	6.1 to 7	42	8.24	2.40		
PHONDIS	5 to 6	42	8.43	1.53	-2.69	.01
	6.1 to 7	42	9.21	1.12		
PHONANAL	5 to 6	42	3.05	4.17	-4.85	.00
	6.1 to 7	42	7.17	3.60		
DELSYPH	5 to 6	42	.86	1.98	-4.33	.00
	6.1 to 7	42	3.29	3.05		
VISDISS	5 to 6	42	60.12	26.92	.14	.89
	6.1 to 7	42	59.36	21.51		
VISDIDA	5 to 6	42	3.43	2.401	-1.08	.28
	6.1 to 7	42	4.00	2.46		
STVMVS	5 to 6	42	3.10	2.06	-3.90	.00
	6.1 to 7	42	4.71	1.73		
AUSTMD	5 to 6	42	5.95	2.44	-3.15	.00
	6.1 to 7	42	7.57	2.27		

AUSTMS	5 to 6	42	.86	1.82	-2.70	.01
	6.1 to 7	42	2.02	2.12		
STVISM	5 to 6	42	4.95	2.88	-3.30	.00
	6.1 to 7	42	7.00	2.80		
STVSM	5 to 6	42	6.83	4.47	-4.30	.00
	6.1 to 7	42	11.19	4.81		
RAN	5 to 6	42	50.17	14.20	4.05	.00
	6.1 to 7	42	39.58	9.28		
REWF	5 to 6	42	1.43	2.01	-5.01	.00
	6.1 to 7	42	4.26	3.06		
REWT	5 to 6	42	9.07	4.31	-1.26	.21
	6.1 to 7	42	10.14	3.46		
VOCWC	5 to 6	42	7.38	1.41	-2.51	.01
	6,1 to 7	42	8.10	2.88		

Table 4: Comparison of average results according to the age and t-test to compare the statistically significant differences according to age

Most tests of prereading competence demonstrated statistically significant differences between the younger and older groups of children, in favor of the older group. The younger group of children have most of their prereading competence still under development, while in the older group of children the development of prereading competence is practically completed. The younger group of children was exceptionally more successful on the test which measures the ability of syllable analysis. The reason for this is that the younger group of children had training in syllable analysis, while the children in first class learned only phoneme analysis. Jerman (2000) argues that children develop the ability of phoneme analysis after the fifth or sixth year of age, before they are capable of dividing words into syllables. But children don't develop this ability spontaneously. They need to learn it with the help of adults. We did not find statistically significant differences between both age groups on tests of identifying rhymes, syllable synthesis, visual discrimination, and recalling words on a certain term.

– Are the tests reliable?

Reliability of the test of prereading competence was tested with Cronbach's coefficient alpha. Tests of ability are reliable enough if the value of the coefficient is higher than 0.70 (Sagadin 2003). The table below shows the value of the coefficient for each test separately and also for the entire test of prereading competence. Tests that measures phonological ability achieve the highest level of reliability. Tests of visual discrimination, rapid naming, and basic vocabulary and understanding have reliability just below the limit of good reliability. The entire test of prereading competence has good reliability; Cronbach's coefficient alpha is 0.80.

Tests	Cronbach's coefficient alpha
Tests of phonological awareness: – Rhymes – Syllable synthesis – Syllable analysis – First sound – Phoneme discrimination – Phoneme analysis – Syllable/phoneme deletion – Recalling the words on a certain phoneme	0.83
Test of visual discrimination	0.69
Tests of short-term memory: – Verbal memory – Auditory memory for digits – Working memory – Visual memory – Visual-spatial memory	0.70
Test of rapid naming	0.69
Tests of vocabulary: – Recalling words on a certain term – Basic vocabulary and understanding	0.68
Entire test	0.80

Table 5: Evaluation of reliability of tests

Conclusion

At the theoretical introduction, we presented prereading competences which, according to numerous authors, have an impact on success in learning to read. The following abilities in starting learning to read are important: phonological awareness, visual abilities, long-term memory (vocabulary, grammar, etc.), fast retrieval of information from long-term memory and short-term memory. We designed a battery of tests, based on well-established foreign and Slovenian instruments or tools that assess prereading competence of children. Through research, we determined the level of development of prereading competence in children aged 5 to 7 years, and compared the successfulness of girls and boys as well as older and younger groups of children. We considered the fifth percentile as a criterion for the determination of children who are at risk for learning difficulties. On this basis, experts in educational institutions may identify children who show a greater risk of developing a reading disorder. Preventive programs and early assistance will reduce the number of pupils who need additional forms of assistance, which is especially important in times of economic restriction. We must equip professional workers with knowledge and strategies for working with children with different competencies besides giving them a set of tests that is easy to use. Preventive programs should be long-term oriented with clearly defined activities. Permanent research work is needed in this area.

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