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Phonological Awareness and Letter Knowledge: Indicators of Early Literacy in Croatian

Jelena Kuvač Kraljević[1], Mirjana Lenček[1], Krunoslav Matešić[2]
[1]*Department of Speech and Language Pathology, Faculty of Education and Rehabilitation Sciences, University of Zagreb*
[2]*Department of Psychology, Catholic University of Croatia*

Abstract

In this paper, the relationship between phonological awareness and letter knowledge and their inherent structures in the period of early literacy are examined. In this cross-sectional study involving 746 children, factor analysis was performed one year before children began formal education, in order to define the latent variables that underlie manifest variables of phonological awareness and letter knowledge in Croatian, a language with transparent orthography. The results suggest that rhyme is equally distributed across both syllabic and phonemic awareness. The results also confirm a correlation between letter knowledge and phonological awareness, and phonemic awareness in particular. The analysis identified two factors related to letter knowledge, in which upper- and lowercase letters demonstrated partially different distributions between the two factors. These findings have implications for educational policy in the area of early literacy, especially in the development of preschool curricula and language intervention programs.

Keywords: *education policy; phonemic awareness; preschool curricula; rhyme; transparent orthography.*

Introduction

Early literacy is a complex construct of competencies and knowledge. It starts to develop before the onset of formal reading and writing instruction and predicts future competency in these areas (Whitehurst & Lonigan, 1998). Recent studies in the area of early literacy have focused on early literacy skills and processes, the inter-relationships between these constructs and their ability to predict later reading and writing competencies as well as academic performance in general. A number

of European and non-European countries are eager to consolidate and integrate the empirical evidence from these studies into national education strategies. For example, researchers and policymakers aim to use current evidence to better define formal teaching during the preschool period (Hood, Conlon & Andrews, 2008).

Early literacy studies have identified two groups of factors that appear to determine the success in mastering early literacy skills. The first group of factors relates to the content of formal preschool instruction, which focuses mainly on linguistic knowledge (Dickinson, McCabe, Anastasopoulos, Peisner-Feinberg & Poe, 2003; Strickland & Shanahan, 2004; Carroll & Snowling, 2004; Nation & Snowling, 2004; Scarborough, 1998). Understanding the linguistic knowledge that best serves early literacy and predicts later success in reading and writing is important because it enables the development of high-quality educational programs as well as intervention programs for children who exhibit below-average development of pre-literacy skills. Formal preschool instruction is also directed towards other abilities and skills in addition to linguistic knowledge, such as visual perception, graphomotor skills and attention.

The second group of factors that predicts early literacy are informal environmental variables (primarily characteristics of the home environment) that can promote literacy development to a greater or lesser degree. These factors relate to informal activities, actions and knowledge that parents should implement during the so-called early reading process (Sénéchal, Le Fevre, Thomas & Daley, 1998; Sénéchal & Le Fevre, 2002; Hood, Conlon & Andrews, 2008; Burgess, Hecht & Lonigan, 2002; Torppa, Poikkeus, Laakso, Eklund & Lyytinen, 2006). The present study is focused on the first group of factors: the language predictors of reading and writing.

Linguistic Predictors: Phonological Awareness and Letter Knowledge[1]

The linguistic knowledge and skills most often emphasized as predictors of reading and writing are phonological skills and processes (Ramus, 2003), specifically phonological awareness and letter knowledge (Blaiklock, 2004; Kadaverek & Justice, 2004; Ivšac Pavliša & Lenček 2011; Lyytinen, Erskine, Aro & Richarson, 2007; Whitehurst & Lonigan, 1998, 2003). In the absence of any formal educational structures, the acquisition of these skills and knowledge in the preschool period can be encouraged through informal and indirect activities, such as creating an environment conducive to learning (Christie, Enz & Vukelich, 2007; Christie, 2008).

Phonological awareness is the ability to consciously think about a spoken word in terms of its basic phonological units - syllable, rhyme and phoneme (Ouellette & Haley, 2013). Most authors working in the field of reading and writing, and phonological

[1] In the Croatian language, the term *letter knowledge* refers to grapheme knowledge because written Croatian consists of 27 graphemes that correspond to 27 *letters* and 3 graphemes (i.e. 3 digraphs that are composed of 2 letters - *lj*, *nj*, *dž*). In this paper, the term letter will be used for easier comparison with the English language literature, in which the term *letter knowledge* is used.

awareness specifically, agree that this awareness evolves from a sensitivity to words and syllables towards an awareness of smaller segments represented by phonemes (Stanovich, 1992; Anthony, Lonigan, Driscoll, Phillips & Burgess, 2003; Carroll, Snowling, Hulme & Stevenson, 2003; Ziegler and Goswami, 2005; Ouellette & Haley, 2013).

Phonological awareness can be divided into implicit and explicit processes, reflecting different levels of cognitive complexity (Morais, 1991; Ouellette & Haley, 2013). Implicit processes relate to the identification and division of words and syllables: for example, the syllable series *va-za* makes the word *vaza* (English, *vase*) and vice versa. Explicit processes relate to phonemic structure: the phoneme series *v-a-z-a* makes the word *vaza* and vice versa. Awareness of phonemes, often perceived as a "higher" level of phonological awareness, is called phonemic awareness. This higher-level awareness might be further categorised based on the usage principle as either analytic or syntactic skill (Ouellette & Haley, 2013). The syntactic skill includes the ability to blend a series of phonemes into larger units such as a syllable or word, while the analytic skill includes the ability to segment a word into phonemes. Empirical evidence suggests that these two skills have two distinct developmental trajectories and that the syntactic skill precedes the mastery of the analytic skill (Anthony et al., 2003, Ouellette & Haley, 2013). Moreover, Ouellette & Haley (2013) emphasize that these two skills should be encouraged and evaluated separately during the development of phonological awareness.

In a series of studies based on a large number of participants and multiple measures, Anthony and Francis (2012) confirmed that phonological awareness represents a single cognitive ability which is manifested behaviourally in a variety of skills – blending, segmenting and other more demanding levels of manipulation, such as deletion, addition, substitution at syllable and phoneme levels as well as rhyme recognition and production. Further, it is well established that in various languages children's sensitivity to phonological units of words follows a hierarchical structure starting with syllabic awareness, which is already present in children 3-4 years old. This is followed by rhyme, which is understood and used by 4-5-year-olds, and it culminates in phonemic awareness (Goswami & Bryant, 1990).

As with phonological awareness, the role of letter knowledge or letter naming has been highlighted in a series of studies examining learning acquisition of the reading skill (Scarborough, 1998, Lonigan, Burgess & Anthony, 2000; Torppa et al., 2006). Letter knowledge is the strongest independent predictor of reading success (McBride-Chang, 1999), with correlations between .33 and .76 (Scarborough, 1998). This strong correlation has been verified in several languages (Muter & Diethelm, 2001) and is especially valid for alphabetic languages with transparent orthography (Anthony & Francis, 2012). Letter naming is a concept involving the awareness that a letter has several identities visible in graphically different presentations (uppercase and lowercase letters), as well as its own name and sound realization (Foulin, 2005). The letter name is a consistent category in all languages regardless of orthography. According to the *Croatian orthography manual* (Jozić, et al., 2013), the name of a consonant is usually

constructed by adding an /*-e/ or /e-*/ either before or after the consonant (e.g. *ɛf, ɛl, ɛλ or tsɛ, ʒɛ, ge, te*) or, in only two cases, by adding an /*a*/ (/*h*ɑ/ and /*k*ɑ/). However, these letter names are not used in the systematic manner described in the *Croatian orthography manual*. Instead, it is evident that children rely on sound form in naming a letter, where /ts/ is /ts) and not /tsɛ/. This is additionally confirmed by letter naming tasks and examples of the manner in which children analyse words in phoneme analysis tasks. For example, children will analyse the word *sok* (eng. *juice*) as *s-o-k* [so:k]and not as *es-o-ka* [s-o-k- ɑ].

In regard to the name and sound of letters, there are significant differences in languages with varying letter transparency. Namely, the discrepancy between the letter name and its pronunciation is a feature of languages with opaque orthography, such as English. For example, the pronunciation of the letter c in different words is variable: in the word *cat*, it is pronounced /*kæt*/, while in the word *city*, it is pronounced /*'sɪti*/. The main feature of languages with transparent orthography is a consistent relationship between the grapheme and the phoneme. This is evident in languages such as Finnish, Italian, Greek, Hebrew, and Croatian. In these languages, one grapheme represents one phoneme. In the Croatian language, the pronunciation of the grapheme *c* in the words *car, crkva or medicina* is always the same, i.e. [ts]. Therefore, in languages with transparent orthography, results on the letter knowledge task correspond to those in the letter naming task and both tasks provide a unified result (Torrpa et al., 2006; Lenček, Kuvač Kraljević & Matešić, 2012). Letter naming is in close interaction with phonemic awareness. According to Torppa et al. (2006), phonemic awareness and its relationship with letter naming are understandable because the graphemes in written language correspond to the phonemes in spoken language. Letter naming facilitates comprehension and acquisition of the letter-sound relationship (Share, 2004) and comprehension of the symbolic nature of written language.

To date, studies examining letter acquisition in the period of early literacy have mostly been conducted in the English language. These studies demonstrate that English-speaking children begin to differentiate and name uppercase letters earlier than lowercase letters, learn more quickly those letters that can be easily differentiated visually and are more familiar with letters in the first half of the alphabet than with those in the second half (Smythe, Stennett, Hardy & Wilson 1970/71). These authors also found that children more quickly master letters that demonstrate congruence between the letter name and its pronunciation, such as *m* [ɛm], but that children are also more successful in mastering those letters which they are directly taught. Children in the USA are better at naming letters while children in the UK perform better at producing letter sounds (Ellefson, Treiman & Kessler, 2009). In the US, there are state, federal and professional standards and measurements for letter naming precisely because of the recognized importance of this pre-literacy skill for learning to read and write (Bracken & Crawford, 2010; Piasta, Petscher & Justice, 2012). Although the relationship between letter name and letter sound in languages with transparent

orthography is unambiguous, research focused on the development of the letter naming skill and the factorial features that determine the speed and direction of its development is limited in comparison to research examining other early literacy skills, such as phonological awareness.

Methods

Aim and Hypothesis

The conceptualization of phonological awareness using three subcomponents - syllable, rhyme and phoneme - and of letter knowledge using upper- and lowercase letter categories raises questions regarding the factorial structure of these two skills in the preschool period. The aim of the present study is to identify the latent variables that underlie the manifest variables of phonological awareness and letter knowledge in preschool-aged Croatian speakers. As such, this study aims to determine the relationship between phonological awareness and letter knowledge.

We expected to identify the multifactorial nature of phonological awareness and letter knowledge. Further, we hypothesized that rhyme would demonstrate a significant association with the development of phonemic awareness, the more cognitively demanding skill in phonological awareness. We also expected to find a high positive correlation between phonological awareness and letter knowledge.

Participants

This study involved 746 children (380 girls, 366 boys) of preschool age from 19 counties throughout Croatia. The average age was 6.6 years (age range: 5.10 – 7.2). All participants were enrolled in preschool and were monolingual speakers with typical language and cognitive development profiles.

Instrument

Children were assessed using the Test for the Assessment of Reading and Writing Prerequisites (PredČiP; Kuvač Kraljević & Lenček, 2012). PredČiP is a standardized test intended for the evaluation of pre-reading skills and skills necessary for learning to read and write. It contains language tasks (rapid automatized naming, phonological awareness tasks, letter knowledge and narration) and visual perception tasks (recognition and copying). Because the present study aimed to examine acquired phonological awareness and letter knowledge and the relationship between these two constructs, the only PredČiP tasks used in the study were those related to phonological awareness and the naming of upper- and lowercase letters (Table 1).

Table 1
Overview of tasks from the PredČiP test used in the present study

Ability		Task	Example item	Number of items	Cronbach `s alpha
Phonological awareness	Rhyme	Recognition Production	*mapa - kapa* *meta -*	7 7	.856
	Syllables	Segmentation Blending	*kuća-* *so-ba*	7 7	.827
	Phoneme	Segmentation Blending	*miš-* *n-o-s*	7 7	.952
Letter knowledge	Naming	Uppercase Letters Lowercase Letters		30 30	.979

Procedure

Each participant was tested individually and completed the tasks in the order listed in Table 1. Prior to each task, children completed a practice test to ensure that poor performance was not due to a lack of understanding of the task but rather to the lack of specific knowledge. Testing was conducted in the following manner:

In the rhyme recognition task, the participant simply had to identify with a yes or no response whether two words rhymed (for example, *mapa-kapa*).

In the rhyme production task, a word was presented and the participant was asked to produce another word that rhymes with the presented word, regardless of meaning. For example, children were presented with *meta* and could answer with *teta, peta, veta*, or *geta*, all of which rhyme with *meta* but do not necessarily mean anything in Croatian.

In syllable-related tasks, participants were first asked to segment seven words into syllables; in the next task, they were asked to combine a given set of syllables into a word.

In tasks related to phonemic awareness, participants were first asked to segment seven words into phonemes; in the next task, they were asked to combine a given set of phonemes into a word.

In the letter naming tasks, participants were asked to name all the upper- and lowercase letters they knew.

Every correct response was awarded 1 point, for a maximum score of 102 points.

Results

Descriptive Findings

Prior to conducting factor analysis, descriptive data for the variables of phonological awareness and letter knowledge were calculated (Table 2).

The highest result was achieved on the variables rhyme recognition and syllable blending. As expected, the preschool children in our population demonstrated better knowledge of uppercase letters than that of lowercase letters.

Table 2

Descriptive data for phonological awareness and letter knowledge in the study sample

Tasks	M	SD
Syllable segmentation	5.91	1.73
Syllable blending	6.81	.831
Rhyme recognition	6.13	1.37
Rhyme production	5.16	2.37
Phonemic segmentation	4.73	.831
Phonemic blending	4.93	2.50
Uppercase letters	23.87	7.86
Lowercase letters	18.44	9.70

Factor Analysis

In order to examine the structure of phonological awareness and letter knowledge in more detail, factor analysis was conducted. The components used, together with Varimax rotation, are presented in Table 3.

Table 3

Rotated matrix of the phonological awareness components

	Component	
	1	2
Syllable segmentation		.768
Syllable blending		.752
Rhyme recognition	.492	.429
Rhyme production	.483	.476
Phonemic segmentation	.931	
Phonemic blending	.916	

Only saturations of ≥0.40 are presented

From the rotated component matrix, two factors are immediately evident:

1) One factor related to phonemic awareness or deep phonological awareness (phonemic blending and segmentation),
2) A second factor related to syllabic awareness or shallow phonological awareness (syllabic blending and segmentation).

The matrix also suggests a clear and developmentally defined separation between these two factors. In addition, there was a nearly uniform distribution of rhyme variables on both factors.

Letter knowledge - uppercase letters

First, the appropriateness of calculating the factor structure for all uppercase letter variables (30 items) was verified by confirming that the Kaiser-Meyer-Olkin measure of sampling adequacy was 0.98, far above the recommended value of 0.6, and that Bartlett's sphericity test was significant [$\chi^2_{(435)} = 14623.31, p < 0.01$]. As such, all items were adequate for calculating the factor structure.

Because our aim was to create and calculate composite scores for the underlying factors, a principal component analysis was conducted. Initial eigenvalue analysis identified two factors with eigenvalues greater than 1, which explained 49% and 7% of the variance, respectively. Both factors were retained in subsequent Varimax factor rotation. The first factor explained 33% of the variance, while the second factor explained 23%. All items in this analysis demonstrated saturation on their primary factors greater than 0.5. The rotated saturation matrix by factors is presented in Table 4. The correlation between the two factors was 0.62.

Table 4

Particle saturation of the Uppercase Letters variable by factors

	1	2	Communality
A	.573		.328
B	.699		.564
C	.589	.415	.519
Ć		.637	.563
Č		.668	.575
D	.625	.453	.595
Đ		.743	.578
Dž		.681	.466
E	.753		.629
F	.511	.557	.571
G	.492	.625	.633
H	.593	.517	.619
I	.687		.504
J	.534	.574	.615
K	.715		.636
L	.721		.644
Lj		.800	.674
M	.720		.568
N	.725		.608
Nj		.821	.699
O	.608		.388
P	.661	.421	.614
R	.719		.595
S	.727		.589
Š	.432	.580	.523
T	.717		.586
U	.633		.502
V	.650	.450	.624
Z	.602	.484	.596
Ž		.692	.570

Only saturations of ≥0.40 are presented.

This analysis identified the following two factors:

1. The first factor involves the so-called universal graphemes or letters that children master the earliest because they are easy to recognize visually and are common in speech and writing. These include the vowels *A, E, I, O, U* and consonants *B, K, L, M, N, R, S, T*;
2. The second factor defines seven letters particular to the Croatian Latin alphabet: graphemes with diacritics (*Č, Ć, Đ* and *Ž*) and digraphs (*Dž, Lj* and *Nj*).

The remaining 10 graphemes, a prerequisite for the graphemes defined by the second factor, were assigned to both factors. These graphemes either represent prerequisites for the mastery of graphemes with diacritics (for example, *C, D* and *Z*) or are graphically similar to some of the graphemes defined by the first factor (for example, *F, G, H, J, P, Š, V*).

Letter knowledge – lowercase letters

The same method as that used for uppercase letters was performed to calculate the factor structure of the Lowercase Letters variable (30 items) [Kaiser-Meyer-Olkin sampling adequacy, 0.98; Bartlett's sphericity test, $\chi^2_{(435)} = 15260.89$, $p < 0.01$]. Initial eigenvalue analysis identified two factors with eigenvalues greater than 1, which explained 50% and 8% of the variance, respectively. After Varimax rotation, the first factor explained 30% of the variance and the second factor explained 28%. All items in this analysis demonstrated saturation on their primary factors greater than 0.5. The rotated saturation matrix by factors is presented in Table 5. The correlation between the two factors was 0.68.

Table 5

Particle saturation of the Lowercase Letters variable by factors

	1	2	Communalities		1	2	Communalities
a	.665		.588	l		.690	.517
b		.635	.481	lj		.770	.661
c	.708		.572	m	.642		.556
ć	.746		.563	n	.567	.555	.630
č	.653		.585	nj		.764	.681
d		.707	.585	o	.619		.538
đ		.789	.659	p	.739		.640
dž		.690	.512	r	.555	.578	.642
e	.587	.498	.593	s	.742		.568
f		.697	.560	š	.636		.545
g		.772	.675	t	.424	.653	.606
h		.759	.624	u	.652		.576
i	.606		.485	v	.780		.649
j	.510	.511	.520	z	.735		.624
k	.801		.663	ž	.602	.462	.575

Only saturations of ≥0.40 are presented.

As was the case in the analysis of uppercase letters, this analysis identified two factors. However, the lowercase letters were not distributed across the two factors in the same way as in the uppercase solution.

The first factor relates to vowels that occur frequently and are easily recognizable visually (*a, i, o, u),* as well as consonants that closely resemble their uppercase counterparts (*c, č, ć, k, m, p, s, š, v, z)*.

The second factor relates to digraphs (*lj, nj* and *dž)* and consonants closely resembling one another (*b, d, đ, g, h, f)*.

Six letters were assigned to both factors: *e, j, n, r, t* and *ž*.

Correlation

Significant correlations, ranging from low to moderate in strength, were observed between each of the six variables of phonological awareness and each of the two variables of letter knowledge (Table 6). These results suggest that latent factors underlie all the early literacy skills measured in this study.

The strongest correlation was observed between the phoneme awareness skills of segmentation and blending on one side and letter knowledge on the other. This is consistent with the fact that, in the Croatian language, letters are graphic representations of phonemes.

Table 6

Pearson's correlation analysis for the identification of relationships between phonological awareness and letter knowledge

	Uppercase letters	Lowercase letters
Syllable segmentation	.35**	.32**
Syllable blending	.27**	.24**
Rhyme recognition	.34**	.33**
Rhyme production	.30**	.28**
Phonemic segmentation	.65**	.68**
Phonemic blending	.66**	.70**

**Correlation is significant at the level of $p < 0.01$

Discussion

Previous research has confirmed that early literacy is strongly related to later academic achievement, completion rates at various levels of education, professional success and overall individual quality of life (Kern & Friedman, 2008). This construct is understood only through a consideration of a comprehensive range of theories, including cognitive language processing models, contextual and cognitive-oriented socio-cultural models, and ecological and environmental theories that explore formal and informal learning of written language (Neuman & Dickinson, Introduction, 2001). The complex and multi-faceted nature of the early literacy construct raises a large number of new questions, especially in light of the fact that the various skills determining early literacy are often associated with the specificity of individual languages and scripts (Scarborough,

1998; Molfese, Molfese, Beswick, J. Jacobi Vessels, Key, Starkey, 2008; Kuvač Kraljević & Lenček, 2012; Pinto, Iliceto, Melogno, 2012). This is especially true in the domain of phonological awareness, narrative ability, and lexical and letter knowledge. As previously mentioned, numerous studies, predominantly those related to the English language, have demonstrated the significance of phonological awareness and letter knowledge for success during subsequent formal, systematic learning of reading and writing. Much less is known about the inherent structure of these skills in languages with transparent orthography, with what little is known stemming mainly from studies of Finnish speakers (see Lyytinen et al., 2007, Torrpa et al., 2006). As such, the present paper sought to examine the latent structure behind the manifest variables of phonological awareness and letter knowledge and the relationship between these two variables in the Croatian language. This study was conducted with children one year prior to their expected start of formal reading instruction.

Our findings indicate that preschool children perform much better on tasks of implicit ability, i.e. on tasks involving the awareness of larger units (syllables) and the recognition of similarities between words based on rhyme than on tasks of explicit awareness that involve phonemes. This discrepancy between implicit and explicit awareness is consistent with the results reported by Anthony et al. (2003) in a study conducted with more than 900 kindergarten children. Indeed, studies from across several languages suggest that preschool children are more sensitive to larger phonological units (syllables, rhyme), which is a developmental predecessor of the acquisition of skills and knowledge that recognize the phoneme as the basic unit (Ziegler & Goswami, 2005). In the phase just prior to beginning formal education, children have already spent several years automating skills based on syllables, which they can recognize and use from the age of 3-4 years, and rhyme, which they can recognize and produce from the age of 4-5 years.

The development of phonemic awareness, or the ability to solve tasks based on these smallest of units, is determined by the initiation of formal instruction in reading and writing, regardless of when this process actually starts (in different countries, children enter formal education at varying ages). In Croatia, while most children demonstrate phonemic awareness beginning at around the age of 6 years, primary school begins when children are between the age of 6.6 and 7 years. Croatian speakers younger than 6 years of age can recognize the first phoneme in words and, from around 6 years of age, can solve tasks related to phoneme segmentation and blending (Vancaš, 1999). Children in countries in which formal education starts at a younger age can successfully solve these tasks quite a bit earlier (in some cases, even at the age of 4.9 years) (Muter, Hulme, Snowling & Stevenson, 2004). This claim is also supported by findings from studies with adults who have never developed reading and writing skills (Morais, Cary, Alegria & Bertelson, 1979) and, as such, have not developed expected levels of phonemic awareness. The results of this study confirm the developmental trajectory of phonemic awareness, regardless of the orthography type (Lyytinen at al., 2007).

Factor analysis examining the structure of the phonological awareness variable in preschool Croatian speakers revealed two factors that reflected the separation of shallow, syllabic phonological awareness from deep, phonemic awareness. Factor analysis of the rhyme variable (recognition and production) suggests that rhyme is distributed equally onto both factors of syllabic and phonemic awareness factors. Arguably, rhyme plays a role in the transition from syllabic to phonemic awareness during the preschool period. According to Bryant, Maclean, Bradley & Crossland (1990), rhyme includes intra-syllabic (Treiman, 1987) units that are, in regards to size, somewhere between a syllable and a phoneme. For example, a child who does not yet demonstrate phonemic awareness can nevertheless recognise that the words *muž* and *puž* create a rhyme but also that these words have a similar structure. In the early reading period, phonemic recognition can facilitate visual recognition of the whole unit and, in turn, contribute to the transition towards the separation of the unique features of the alphabetic code (Frith, 1986).

Letter knowledge in the preschool period is the single best predictor of early reading performance once formal instruction commences (McBride-Chang, 1999; Lonigan et al., 2000; Torppa et al., 2006). Early research examining the relationship between phonological awareness and letters indicated that letter knowledge can facilitate visual recognition of words (McGee, Lomax & Head, 1988). Letter knowledge involves recognition of the graphical form and name of a letter and, in languages with opaque orthography, the pronunciation of sounds (Foulin, 2005). More recent studies emphasize that letter knowledge can facilitate phonologically-based reading strategies. Considering these earlier and later studies together highlights the possibility that letter knowledge can create links between visual and phonological (phoneme-focused) strategies, which indeed is expected during the transition from the pre-alphabetic literacy phase to the alphabetic reading phase (Frith, 1986).

The findings from the present study indicating that preschool children are more familiar with uppercase letters than lowercase ones are consistent with research demonstrating the same result during early literacy and early reading phases (Smythe et al., 1970 – 71). This preference may reflect the fact that the graphical features that help children differentiate letters become more prominent in uppercase letters. In addition, these letters are more frequently used in a child's everyday environment (Ellefson et al, 2009). As such, adults are more likely to emphasize these letter forms and encourage children to use them from the outset (Worden & Boettcher, 1990).

Factor analysis of the Uppercase Letters variable identified two factors, the first of which includes letters that are easier to recognize visually and are mastered earlier. These letters are present in all languages with Latin alphabets and, as such, are ubiquitous in children's environments – from advertisements, posters and signage in the media to targeted exposure in preschool programs. The second factor relates to letters specific to the Croatian Latin alphabet that contain diacritics and digraphs: *č, ć, đ, š, ž, lj, nj, dž.* Other studies with Croatian children have similarly identified these letters as those

that pose a challenge during early formal reading instruction (Pavličević-Franić, 2005). They are also especially difficult for children learning Croatian as a second language (Cvikić & Kuvač, 2003).

Factor analysis of the Lowercase Letters variable also revealed two factors. However, the distribution of letters into each factor differed from that for uppercase letters. Smythe et al. (1970 – 71) reported similar results for languages with opaque orthography and concluded that "*No clear-cut evidence of alphabet sequence or position effect is apparent in the melange that defines this factor*" (p. 31). In the present study, the first factor contains lowercase letters that strongly resemble their uppercase counterparts. This includes lowercase letters with the same shape as their uppercase forms but with diacritical marks (e.g. *č, ć, š, ž)*. This suggests that preschool children disregard the diacritical marks of letters and instead focus on their overall form. The second factor contains lowercase letters that are the most difficult to identify visually and are typically mastered last by children (*b, d, f, g, h, l*). The lack of distinctive graphical features in these letters (such as the uppercase *I* and lowercase *i* or the letter pair *b-d*) may help explain why children take longer to master them. In addition, the letters *b, f, g, h* from the second factor represent sounds that are used less often in spoken Croatian (Vuletić, 1990; Kuvač Kraljević et al., in press). The varying distribution of upper- and lowercase letters across each of the two factors suggests that different processes underlie upper- and lowercase letter knowledge.

Considered together, the factor analysis of Phonological awareness and Letter knowledge variables confirms the hypothesis that both variables exhibit multifactorial structures in the early literacy period for the Croatian language. Furthermore, the results of the present study confirm the hypothesis that letter knowledge is positively correlated with phonological awareness in the preschool period. Given that numerous studies have identified phonological awareness and letter knowledge as the most important predictors of reading and writing success, this correlation during the period of early literacy is not surprising. Nevertheless, the strongest correlation was found between letter knowledge and phonemic awareness, a finding that supports the already confirmed letter-sound relationship or, in other words, the link between the sounds in the words and the letters that graphically represent them in written language.

Conclusion

Numerous studies have demonstrated that high-quality early education benefits both individuals and society in the long term (Bowman, Donovan & Burns, 2000). Quality assurance implies the development of standards for ensuring good outcomes in the domain of early literacy, which might be achieved through a precise and clearly defined curriculum and ensuring the competences of those who will implement this curriculum. The foundations of any standards and curriculum for early literacy should be language, awareness of the printed text, and emerging literacy. Persons and institutions responsible for early childhood education must carefully consider each

of these areas, and those related to phonological awareness and literacy in particular (Strickland and Riley-Ayers, 2006).

The motivation for the present study arose from a lack of data regarding the nature of phonological awareness and letter knowledge in Croatian, a language with transparent orthography, and a lack of data concerning the pre-literacy skills that have predictive value for later reading and writing. As such, the present study offers the first data about pre-literacy skills in the Croatian language.

The factor analysis of Phonological awareness and Letter knowledge conducted in this study confirms the hypothesis that both variables demonstrate multifactorial structures in the period of early literacy among Croatian speakers.

This finding has implications for the creation of preschool curricula aimed at developing literacy skills. For example, the results of the present study emphasize:

a) the importance of combining tasks that encourage both implicit and explicit levels of phonological awareness – the development of phonological awareness should be encouraged to progress from larger to smaller units;
b) the importance of incorporating rhyme-based activities to promote phonemic awareness;
c) the appropriate sequence for the mastery of phonemic awareness, from blending skills towards segmentation skills;
d) the order of letter learning – letters included under the first factor are those that children should acquire first.

Together, these findings will be of particular importance not only for ensuring good progress in reading and writing among children with typical language development but also for the development of preventive and intervention measures for children at risk of having reading and writing difficulties. To do so, it is especially important for early literacy programs to precisely define language knowledge and the extent to which children need to master such knowledge in order to be able to read and write (see Bežen, Budinski and Kolar Billege, 2013). In addition, programs need to define the experiences children should have with written materials, the content that should be included in materials for encouraging early literacy, and the methods through which the status of early literacy and its progress should be measured (Kolar Billege, 2015).

The Croatian educational system needs programs that can ensure the previously mentioned standard outcomes, primarily in the domain of language indicators of literacy, but also in relation to information for encouraging early literacy in the home environment. The data regarding the competencies of persons directly involved in early education, namely, preschool teachers, are equally important. Raising the Competencies of these individuals will contribute to the development of special programs, which are tailored to smaller groups and follow the general principles of early literacy while acknowledging family, cultural, and geographical diversity.

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Jelena Kuvač Kraljević
Department of Speech and Language Pathology
Faculty of Special Education and Rehabilitation Sciences
University of Zagreb
Borongajska cesta 83f, 10 000 Zagreb, Croatia
jelena.kuvac@erf.hr

Mirjana Lenček
Department of Speech and Language Pathology
Faculty of Special Education and Rehabilitation Sciences
University of Zagreb
Borongajska cesta 83f, 10 000 Zagreb, Croatia
jelena.kuvac@erf.hr

Krunoslav Matešić
Department of Psychology
Catholic University of Croatia
Ilica 242, 10 000 Zagreb, Croatia
krunoslav.matesic@unicath.hr

Fonološka svjesnost i poznavanje slova: pokazatelji rane pismenosti u hrvatskome jeziku

Sažetak

U radu se ispituje povezanost fonološke svjesnosti i poznavanja slova kao i njihova faktorska struktura u razdoblju rane pismenosti. Istraživanje se temelji na metodi presjeka i uključuje 746 djece koja su ispitana godinu dana pred polazak u školu. Provedena je faktorska analiza kako bi se odredile latentne varijable koje leže u pozadini manifestnih varijabli fonološke svjesnosti i poznavanja slova u hrvatskome jeziku kao jeziku transparentne ortografije. Podatci upućuju da je rima podjednako raspodijeljena na slogovnu i fonemsku svjesnost. Potvrđuje se i korelacija između poznavanja slova i svih razina fonološke svjesnosti, posebice fonemske svjesnosti. Analiza otkriva i dva faktora na varijabli poznavanja slova, pri čemu mala i velika i mala formalna slova pokazuju djelomično drugačiju raspodjelu između ta dva faktora. Dobiveni nalazi trebaju biti ugrađeni u obrazovnu politiku, i to u području predškolskoga obrazovanja, pri oblikovanju predškolskoga kurikula i planiranje intervencijskih jezičnih programa.

Ključne riječi: *fonemska svjesnost; obrazovna politika; predškolski kurikul; rima; transparentna ortografija.*

Uvod

Rana pismenost složeni je konstrukt kompetencija i znanja koja se počinje razvijati prije početka formalnoga učenja čitanja i pisanja te služi i kao njihov razvojni pretkazatelj (Whitehurst i Lonigan, 1988). Novija istraživanja u području rane pismenosti još uvijek su usmjerena na jasno određivanje vještina i procesa rane pismenosti kao i na njihova pripadajuća obilježja, međusobnu povezanost te jačinu njihove pretkazateljske uloge za uspješno učenje čitanja i pisanja, a time i akademskoga napretka u cjelini. Zbog važnosti dobivanja odgovora na ova pitanja, europske, ali također i mnoge druge zemlje, nastoje objediniti u svojim nacionalnim strategijama obrazovanja empirijske dokaze takvih istraživanja. Jedan od ciljeva toga objedinjavanja je i valjanije određivanje formalne poduke u predškolskom razdoblju (Hood, Conlon i Andrews, 2008).

U istraživanjima rane pismenosti danas se izdvajaju dvije skupine čimbenika koje određuju uspješnost u ovladavanju vještinama rane pismenosti. Prvu čine već spomenuti

sadržaji formalne rane poduke tijekom predškolskoga odgoja i obrazovanja i oni su najvećim dijelom usmjereni na jezična znanja (Dickinson, McCabe, Anastasopoulos, Peisner-Feinberg i Poe, 2003; Strickland i Shanahan, 2004; Carroll i Snowling, 2004; Nation i Snowling, 2004; Scarborough, 1998). Razumijevanje jezičnih znanja koja najbolje određuju ranu pismenost i pretkazuju kasniji uspjeh u čitanju i pisanju, važno je zbog mogućnosti oblikovanja kvalitetnih programa poticanja i posebno intervencijskih postupaka kod one djece kod koje je razvoj i usvajanje predvještina ispod razine očekivane za njihovu dob. Uz jezična znanja, dio formalnoga poučavanja usmjeren je i na neke druge sposobnosti i vještine - vidnu percepciju, grafomotoriku, pažnju i druge. Drugu veliku skupinu čimbenika čine okolinski i neformalni i oni pretežno sadrže obilježja kućnoga okruženja koja mogu, ali i ne moraju biti poticajna. Unutar ovih čimbenika bitne su neformalne aktivnosti, postupci i znanja koja trebaju imati roditelji u procesu tzv. ranoga čitanja, a kojim mogu utjecati na djetetovo opismenjavanje (Sénéchal, Le Fevre, Thomas i Daley, 1998; Sénéchal i Le Fevre, 2002; Hood, Conlon i Andrews, 2008; Burgess, Hecht i Lonigan, 2002; Torppa, Poikkeus, Laakso, Eklund i Lyytinen, 2006). Ovaj je rad usmjeren na prvu skupinu čimbenika, odnosno jezične pretkazatelje uspješnosti čitanja i pisanja.

Jezični pretkazatelji: fonološka svjesnost i poznavanje slova[1]

Jezična znanja i vještine koje se najčešće naglašavaju kao pretkazatelji čitanja i pisanja su fonološke vještine i procesi (Ramus, 2003), a unutar njih svakako je najčešće izdvajana i ispitivana fonološka svjesnost i uz nju poznavanje slova (Blaiklock, 2004; Kadaverek i Justice, 2004; Ivšac Pavliša i Lenček 2011; Lyytinen, Erskine, Aro i Richarson, 2007; Whitehurst i Lonigan, 1998, 2003). Usvajanje ovih jezičnih vještina i znanja u predškolskom razdoblju pripadaju sadržajima koji se mogu poticati neposredno ili stvaranjem prilika i okruženja za učenje, odnosno oblikovanjem uvjeta za učenje na manje formalan način (Christie, Enz i Vukelich, 2007; Christie, 2008).

Fonološka svjesnost sposobnost je svjesnoga promišljanja o izgovorenoj riječi u odnosu na njezine osnovne fonološke jedinice - slog, rimu i fonem (Ouellette i Haley, 2013). Većina autora koji se bave čitanjem i pisanjem, a unutar toga posebno fonološkom svjesnosti, slaže se da se ona razvija od osjetljivosti na riječi i slogove do svjesnosti o manjim segmentima koje predstavljaju fonemi (Stanovich, 1992; Anthony, Lonigan, Driscoll, Phillips i Burgess, 2003; Carroll, Snowling, Hulme i Stevenson, 2003; Ziegler i Goswami, 2005; Ouellette i Haley, 2013).

S aspekta kognitivne složenosti, fonološka svjesnost može se podijeliti na implicitnu i eksplicitnu (Morais, 1991; Ouellette i Haley, 2013). Implicitna se odnosi na aktivnosti vezane uz razinu riječi i sloga. Primjerice, niz slogova *va-za* čini riječ *vaza* i obratno.

[1] Termin poznavanje slova zapravo se u hrvatskom odnosi na poznavanje grafema jer hrvatsko pismu sadrži 27 grafema koji odgovaraju 27 slova i 3 grafema, tj. 3 digrafa koji su sastavljeni od po 2 slova – *lj*, *nj*, *dž*. U radu će se koristiti termin slovo radi lakše usporedivosti s engleskom literaturom u kojoj se rabi termin *letter knowledge*.

Eksplicitna se odnosi na fonemsku razinu. Primjerice, niz fonema *v-a-z-a* čini riječ *vaza* i obratno. Svijest o pojedinim fonemima, odnosno glasovima, često percipirana i kao „viša" razina, naziva se fonemskom svjesnošću. Ova viša razina može se podijeliti i s obzirom na načelo uporabe - na vještine raščlambe i vještine stapanja (Ouellette i Haley, 2013). Stapanje se odnosi na povezivanje nizova fonema u veće jedinice kao što su slog ili riječ, a vještina raščlambe na odjeljivanje riječi na foneme. Postoje empirijski dokazi koji upućuju na to da ove dvije vještine imaju zasebne razvojne putanje i da vještina stapanja prethodi ovladavanju vještinom raščlambe (Anthony i sur., 2003, Ouellette i Haley, 2013). Štoviše, Ouellette i Haley (2013) naglašavaju da ove dvije vještine trebaju biti poticane i procjenjivane zasebno tijekom razvoja fonološke svjesnosti.

Na temelju niza istraživanja utemeljenih na velikom broju ispitanika i višestrukim mjerenjima Anthony i Francis (2012) dokazali su da je fonološka svjesnost jedinstvena kognitivna vještina koja se bihevioralno manifestira u različitim vještinama - stapanju, raščlambi i drugim višim razinama baratanja kao što su brisanje, nadodavanje i premještanje na razini sloga i fonema te prepoznavanju i proizvodnji rime. Također, značajan broj istraživanja, i to u različitim jezicima, pokazao je da dječja osjetljivost na fonološke jedinice riječi prati hijerarhijsku strukturu počevši od slogovne svjesnosti koja je prisutna već u dobi od tri i četiri godine, preko rime koju dijete razumije i proizvodi u dobi od četiri i pet godina do fonemske svjesnosti (Goswami i Bryant, 1990).

Jednako kao fonološka svjesnost i uloga poznavanja slova, odnosno imenovanja slova, istaknuta je u nizu istraživanja usmjerenih na učenje čitanja (Scarborough, 1998, Lonigan, Burgess i Anthony, 2000; Torppa, i sur., 2006). Prema nizu autora, poznavanje slova najsnažniji je pojedinačni pretkazatelj uspjeha u čitanju (McBride-Chang, 1999) s koleracijom između 0,33 i 0,76 (Scarborough, 1998). Iako se to potvrdilo u brojnim jezicima (Muter i Diethelm, 2001), ono posebno vrijedi za alfabetske jezike s transparentnom ortografijom (Anthony i Francis, 2012). Naime, poznavanje slova je koncept koji uključuje svjesnost da slovo ima nekoliko identiteta vidljivih u grafički različitim izvedbama (velika i mala formalna slova, velika i mala rukopisma slova), ali i svoje ime te svoje izgovorno ostvarenje (Foulin, 2005). Naziv slova nepromjenjiva je kategorija u svim jezicima bez obzira na ortografiju jezika. Prema *Hrvatskom pravopisu* (Jozić i sur., 2013) nazivu suglasnika dodaje se najčešće *-e* ispred ili iza samog suglasnika (primjerice, *ef, el, elj* ili *ce, že, ge, te*) te u svega dva slučaja *-a* (*ha* i *ka*). Nazivi samoglasnika identični su fonemima. Međutim, ovi nazivi slova ne upotrebljavaju se sustavno kao što je opisano u *Hrvatskom pravopisu* već je, posebno kod djece, vidljivo da se u nazivu slova, odnosno imenovanju oslanjaju na izgovorni oblik pa je tako *c* upravo *c*, a ne *ce*. Ovo potvrđuju zadatci imenovanja slova kao i primjeri kako djeca raščlanjuju riječ u zadatcima fonemske raščlambe. Primjerice riječi *sok* dijete će raščlaniti na *s-o-k*, a ne *es-o-ka*.

U odnosu na naziv slova i njegov izgovor postoje značajne razlike u jezicima s obzirom na transparetnost njihovih pisama. Nepodudarnost između naziva slova i njegova izgovora u riječi je obilježje jezika s netransparentnom ortografijom, kao što je

to engleski jezik. Tako je u engleskom izgovor slova *c* u različitim riječima promjenjiv, primjerice, u riječi *cat* on će biti \kæt\, a u riječi *city* \ˈsɪti\. U jezicima s transparentnom ortografijom glavno je obilježje dosljedna ili dosljednija veza grafema i fonema i ona je vidljiva, primjerice, u finskom, talijanskom, grčkom i hrvatskom u kojima u pravilu jedno slovo predstavlja jedan fonem: u hrvatskom jeziku izgovor grafema *c* u riječi *car*, *crkva* ili *medicina* je uvijek isti. Stoga u jezicima transparentne ortografije rezultati na zadatcima poznavanja slova odgovaraju onima na zadatcima imenovanja slova te ove dvije kategorije provjere daju jedinstveni rezultat (Torrpa i sur., 2006; Lenček, Kuvač Kraljević i Matešić, 2012). Imenovanje slova u interakciji je s fonološkom svjesnosti, odnosno fonemskom svjesnosti i ta veza je, prema Torppa i sur. (2006) potpuno i lako razumljiva jer grafemi u pisanom jeziku odgovaraju fonemima iz govornoga jezika. Imenovanje slova pomaže razumijevanju i usvajanju odnosa slovo-glas (Share, 2004) i razumijevanju simboličke prirode pisanoga jezika.

Istraživanja o ovladavanju slovima u razdoblju rane pismenosti uglavnom su provedena u engleskom jeziku i pokazuju da djeca prije počinju razlikovati i imenovati velika slova nego mala, brže usvajaju slova koja se lako vizualno razlikuju te bolje poznaju slova iz prve polovice abecede nego iz druge polovice (Smythe, Stennett, Hardy i Wilson 1970/71). Također, utvrđeno je i da djeca brže ovladaju onim slovima kod kojih postoji podudarnost u imenu i izgovoru slova, kao što je primjerice slovo *m*, ali i da su djeca uspješnija u onome čemu su poučavana. Tako su djeca u SAD-u uspješnija u imenovanju slova, a djeca u UK u njihovom izgovoru (Ellefson, Treiman i Kessler, 2009). SAD, osim toga, ima državne, savezne i profesionalne standarde i mjerila imenovanja slova upravo zbog spoznaje o važnosti ove predvještine za početno čitanje i pisanje (Bracken i Crawford, 2010; Piasta, Petscher i Justice, 2012). Iako je odnos imena i izgovornoga ostvarenja slova u jezicima transparentne ortografije jednoznačan, u usporedbi s drugim vještinama rane pismenosti, primjerice fonološkom svjesnosti, malo je istraživačkoga interesa bilo usmjereno prema toj vještini, njezinom razvoju i faktorskim obilježjima koji određuju brzinu i smjer tog razvoja.

Metoda

Cilj i pretpostavke

Konceptualizacija fonološke svjesnosti putem triju razina - sloga, rime i fonema - i poznavanja slova putem velikih i malih formalnih slova otvara pitanje o faktorskoj strukturi ovih dviju vještina u predškolskom razdoblju. Stoga je cilj ovoga istraživanja utvrditi latentne varijable koje stoje u pozadini manifestnih varijabli fonološke svjesnosti i poznavanja slova kod djece govornika hrvatskoga jezika predškolske dobi. Dakako, cilj je i utvrditi povezanost između fonološke svjesnosti i poznavanja slova. Očekuje se višefaktorska priroda fonološke svjesnosti i poznavanja slova. Također, pretpostavlja se da je rima povezana s razvojem kognitivno više zahtjevne vještine fonološke svjesnosti - fonemske te da postoji pozitivna povezanost između fonološke svjesnosti i poznavanja slova.

Sudionici

U ispitivanju je sudjelovalo 746 djece (380 djevojčica i 366 dječaka) predškolske dobi iz 19 hrvatskih županija. Prosječna dob je 6 godina i 6 mjeseci (dobni raspon: 5;10-7; 2). Svi su ispitanici u vrijeme provedbe ovoga ispitivanja bila uključena u program predškolskoga odgoja i obrazovanja i svi su bili jednojezični govornici urednoga jezičnog i kognitivnog razvoja.

Mjerni instrument

Za potrebe ovoga istraživanja upotrijebljen je Test za procjenu predvještina čitanja i pisanja (PredČiP, Kuvač Kraljević, Lenček, 2012). PredČiP je standardizirani test namijenjen procjeni predčitalačkih vještina i vještina neophodnih za usvajanje čitanja i pisanja. Sadrži jezične zadatke (brzo fonološko imenovanje, zadatke fonološke svjesnosti, poznavanje slova i pripovijedanje) i zadatke vizualne percepcije (raspoznavanje i precrtavanje). S obzirom na to da je ovaj rad usmjeren prema ispitivanju usvojenosti fonološke svjesnosti i poznavanju slova te utvrđivanju njihova međuodnosa, u opisu i analizi upotrijebljeni su samo zadatci fonološke svjesnosti i zadatci imenovanja velikih i malih tiskanih slova. Pregled ispitnih zadataka naveden je u tablici 1.

Tablica 1.

Svaki od 6 zadataka fonološke svjesnosti sadrži 7 ispitnih čestica što ukupno čini 42 ispitne čestice na mjeri fonološke svjesnosti. Zadatak poznavanja slova uključivao je imenovanje svih 30 velikih i 30 malih formalnih slova pa je teorijski raspon postignuća na mjeri poznavanja slova od 0 do 60. Pouzdanost unutarnje konzistencije izmjerena je Cronbachovom alfom - indeksom koji pokazuje koliko neki niz ispitnih čestica mjeri neki jednodimenzionalni latentni konstrukt - i rangirana je u rasponu od dobrog do odličnog za sve zadatke.

Sve riječi koje su upotrjebljene u svim zadatcima fonološke svjesnosti zadovoljavale su sljedeće kriterije: poznatost djeci predškolske dobi, prisutnost u djetetovu rječniku, jednosložne ili dvosložne fonološke kombinacije koje su izgovorno lako izvedive. Podatci o navedenim kriterijima odabira riječi provjerene su u Hrvatskom frekvencijskom rječniku dječjeg govornog jezika (Kuvač Kraljević, Hržica i Štefanec, u tisku). Kontrolom tih varijabli u odabiru riječi osiguralo se izravno procjenjivanje fonoloških sposobnosti bez zasićivanja obrade semantičkim pretraživanjem mentalnoga leksikona. U svim zadatcima sve čestice su poredane od jednostavnijih prema složenijim s obzirom na duljinu i fonološku složenost.

U zadatcima imenovanja malih i velikih formalnih slova korištene su dvije liste (lista velikih formalnih slova i lista malih formalnih slova) na kojima su slova nasumce poredana. U obje liste uključena su sva slova hrvatskoga pisma.

Postupak

Svaki sudionik ispitan je pojedinačno redoslijedom kako su zadatci navedeni u tablici 1. Prije svakog zadatka sudionicima su dani zadatci za uvježbavanje kako bi se osiguralo

da slabija postignuća na bilo kojem zadatku nisu posljedica djetetova nerazumijevanja zadatka nego nedostatka određenoga znanja. Ispitivanje je provedeno na sljedeći način:

Na zadatku raspoznavanja rime ispitanik je morao samo prepoznati rimuju li se zadane riječi (primjerice, rimuju li se riječi *mapa-kapa*) dajući pri tome potvrdan ili negativan odgovor.

Na zadatku proizvodnje rime od ispitanika se tražilo da na temelju zadane riječi proizvede riječ koja se s njom rimuje bez obzira na značenje riječi (primjerice, navesti riječ koja se rimuje s riječi *meta*, a mogući su odgovori *teta*, *peta*, ali i *veta*, *geta* koje također zadovoljavaju uvjet rime premda nemaju značenje).

Na zadatcima koji se odnose na slog ispitanik je trebao prvo analizirati, odnosno raščlaniti 7 zadanih riječi na slogove, a u sljedećem zadatku povezati zadani niz slogova u riječ.

Na zadatcima koji se odnose na fonemsku svjesnost ispitanik je trebao prvo analizirati, odnosno raščlaniti 7 zadanih riječi na foneme, a u sljedećem zadatku povezati zadani niz fonema u riječ.

Na zadatcima imenovanja malih i velikih slova ispitanik je trebao imenovati slova koja poznaje.

Za svaku točno riješenu ispitnu česticu ispitanik je dobio 1 bod što znači da je maksimalno postignuće na svim zadatcima u ovom ispitivanju iznosilo 102 boda.

Rezultati

Deskriptivni podatci

Prije faktorske analize izračunati su deskriptivni podatci na varijablama fonološke svjesnosti i poznavanja slova (tablica 2).

Tablica 2.

Najveći rezultat postignut je na varijablama prepoznavanja rime i slogovnoga stapanja. U zadatcima poznavanja slova dobiveni su očekivani rezultati za predškolsko razdoblje: djeca u prosjeku poznaju više velikih nego malih slova.

Faktorska analiza

Da bi se detaljnije ispitala struktura fonološke svjesnosti i poznavanja slova, izvedena je faktorska analiza za svaku od dimenzija. Upotrijebljene su komponente faktorske analize s varimax rotacijom prikazane u tablici 3.

Tablica 3.

Iz provedene rotirane komponentne matrice razvidna su dva faktora:

1. faktor *fonemske svjesnosti* ili duboke fonološke svjesnosti (fonemsko stapanje i raščlamba)
2. faktor *slogovne svjesnosti* ili plitke fonološke svjesnosti (slogovno stapanje i raščlamba).

Matrica upućuje na jasnu odijeljenost ovih dvaju faktora što je razvojno uvjetovano, uz gotovo ujednačenu raspodjelu varijable rime na oba faktora.

Poznavanje slova - velika slova

Prvo je provjerena mogućnost faktorizacije za svih 30 čestica varijable *velika slova*. Kaiser-Meyer-Olkin mjera adekvatnosti uzorkovanja bila je 0,98, što je daleko iznad preporučene vrijednosti od 0,6 te je Bartlettov test sfericiteta bio značajan ($\chi^2_{(435)}$ = 14623,31, $p < 0,01$). Sve su čestice bile prikladne za izračun faktorske strukture.

Izračunata je faktorska analiza glavnih komponenti jer je glavni cilj bio stvaranje kompozitnih rezultata za faktore koji se nalaze u podlozi ove varijable. Početne eigen vrijednosti indicirale su da postoje dva faktora s eigen vrijednostima iznad 1 koja objašnjavaju 49 % i 7 % varijance. Zadržana su oba faktora u daljnjoj analizi. Nakon toga je korištena varimax rotacija faktora. Prvi je faktor objasnio 33 % varijance, a drugi 23 %. Sve čestice u ovoj analizi imale su zasićenja na primarnim faktorima preko 0,5. Rotirana matrica zasićenja po faktorima se nalazi u tablici 4. Korelacija između dobivena dva faktora iznosila je 0,62.

Tablica 4.

U skladu s analizom izdvojena su dva faktora:

- Prvi faktor obuhvaća takozvane univerzalne grafeme, odnosno slova kojima djeca ovladavaju najranije jer se lako vidno prepoznaju i učestali su u govoru i pismu (primjerice, svi samoglasnici *A, E, I, O, U* i suglasnici kao *B, K, L, M, N, R, S, T*)
- Drugi faktor definira sedam slova osobitih za hrvatsku latinicu, odnosno grafemi s dijakritičkim znakovima (*Č, Ć, Đ* i *Ž*) i digrafi (*Dž, Lj* i *Nj*)

Preostalih deset grafema raspodjeljuje se na oba faktora te predstavljaju preduvjet izvedbi grafema definiranih putem drugog faktora. Ti grafemi su ili oni koji su polazišni za ovladavanje grafema s dijakritičkim znakovima (primjerice C, D i Z) ili su grafički slični s nekim od grafema definiranih prvim faktorom (primjerice *F, G, H, J, P, Š, V*).

Poznavanje slova - mala formalna slova

Faktorska struktura za zavisnu varijablu *mala slova* (30 ispitnih čestica) izračunata je jednakim postupkom kao za velika formalna slova [Kaiser-Meyer-Olkin mjera adekvatnosti uzorkovanja je bila 0,98, što je daleko iznad preporučene vrijednosti od 0,6 te je Bartlettov test sfericiteta bio značajan ($\chi^2(435) = 15260,89$, $p < 0,01$]. Početne eigen vrijednosti indicirale su da postoje dva faktora koja objašnjavaju 50 % i 8 % varijance. Nakon toga je provedena varimax rotacija faktora. Prvi faktor je nakon rotacije objasnio 30 % varijance, a drugi 28 %. Sve čestice u ovoj analizi imale su zasićenja na primarnim faktorima preko 0,5. Rotirana matrica zasićenja po faktorima se nalazi u tablici 5. Korelacija između dobivena dva faktora iznosila je 0,68.

Tablica 5.

I ovdje se odjeljuju dva faktora, ali raspodjela malih formalnih slova ne prati u potpunosti raspodjelu zabilježenu kod velikih formalnih slova:

- Prvi faktor - učestala i vizualno lako prepoznatljiva slova - samoglasnici (*a, i, o, u*) te slova koja su vidno i grafički vrlo slična svojim odgovarajućem parnjaku u sustavu velikih slova - *c, č, ć, k, m, p, s, š, v, z.*
- Drugi faktor - digrafi (*lj, nj* i dž) i slova koja su vizualno jako slična *b, d, đ, l, f, g* i h.

Šest slova raspodjeljuje se na oba faktora (*e, j, n, r, t* i *ž*).

Korelacija

Korelacije su, između šest varijabli fonološke svjesnosti s jedne strane i dviju varijabli poznavanja slova s druge strane, sve značajne i kreću se u rasponu od niskih do umjerenih (tablica 6). Ovi rezultati upućuju na to da se latentni faktori nalaze u pozadini svih vještina rane pismenosti koje su mjerene u ovom istraživanju. Najviše korelacije dobivene su između obje vještine fonemske svjesnosti - raščlambe i spajanja - i poznavanja slova što je u skladu s činjenicom da su slova grafičke reprezentacije fonema.

Tablica 6.

Rasprava

Mjere rane pismenosti dokazano su snažno vezane uz kasnije školsko i akademsko postignuće, stopu završnosti na različitim razinama obrazovanja, profesionalni uspjeh i općenito kvalitetu života pojedinaca (Kern i Friedman, 2008). Razumijevanje tog konstrukta moguće je samo sveobuhvatnim poznavanjem teorija koje uključuju modele kognitivne obrade jezika, sociokulturne modele usmjerene na kontekst i kogniciju te ekološke i okolinske teorije koje istražuju formalno i neformalno učenje pisanoga jezika (Neuman i Dickinson, uvodna nap., 2001). Činjenica da konstrukt rane pismenosti nije jedinstven značajno proširuje odabir istraživačkih pitanja, posebno zbog činjenice da se različite vještine koje određuju ranu pismenost sve više vezuju uz osobitosti jezika i pisama (Scarborough, 1998; Molfese, Molfese, Beswick, J., Jacobi Vessels, Molfese, Key, Starkey, 2008; Kuvač Kraljević i Lenček, 2012; Pinto, Iliceto, Melogno, 2012), posebice u domeni fonološke svjesnosti, pripovijedanja, rječničkoga znanja i poznavanja slova. Kako je već navedeno, brojna su istraživanja, pretežno provedena u engleskom jeziku, potvrdila važnost vještina fonološke svjesnosti i poznavanja slova za kasnije formalno i sustavno poučavanje čitanja i pisanja. Međutim, znatno manji broj istraživanja proveden je u svrhu ispitivanja faktorske strukture tih vještina u jezicima transparentne ortografije. Nekolicina spoznaja dostupna je uglavnom iz istraživanja koja su uključivala govornike finskog jezika (vidi Lyytinen i sur., 2007, Torppa i sur., 2006). Stoga je cilj ovoga istraživanja bio utvrditi latentnu strukturu koja stoji u pozadini manifestnih varijabli fonološke svjesnosti i poznavanja slova kao i njihovu povezanost u hrvatskome jeziku u razdoblju neposredno pred početak formalnoga učenja čitanja.

Pregledom osnovnih podataka deskriptivne statistike vidljivo je da razine postignuća djece na različitim zadatcima fonološke svjesnosti slijede već opisane principe postupnosti razvoja u drugim europskim jezicima: od većih jedinica - sloga i rime do manjih jedinica - fonema. Ova diskrepanca između implicitne i ekplicitne svjesnosti u skladu je s istraživanjem Anthony i sur. (2003) koje je uključivalo više od 900 ispitanika. Isti obrazac rezultata nailazi se i u istraživanjima drugih jezika, kako navode i Ziegler i Goswami (2005) - glavnina podataka govori u prilog osjetljivosti djece na veće fonološke jedinice (slog, rimu) i razvojno prethodi usvajanju vještina i znanja koji uključuju fonem kao temeljnu jedinicu. Do dobi pred polazak u školu, djeca imaju nekoliko godina za automatizaciju vještina temeljenih na slogu (slog mogu prepoznati i njime baratati već u dobi između 3. i 4. godine) i rimi (treba biti prepoznatljiva i moći se proizvoditi u dobi između 4. i 5. godine).

Fonemska svjesnost, odnosno mogućnost rješavanja zadataka temeljenih na ovim najmanjim jedinicama, u pravilu je određena početcima čitanja i pisanja u smislu formalne pouke, bez obzira kada ovaj proces započinje (u različitim državama djeca u različitim dobima započinju s obrazovanjem). Tako djeca u Hrvatskoj, koja uglavnom kreću u osnovu školu u dobi između 6; 6 i 7 godina, tek oko šeste godine osvještavaju fonem - najprije prvi fonem u riječima, a onda mogu rješavati i zadatke raščlambe i stapanja fonema (Vancaš, 1999). Podatci o djeci iz zemalja u kojima se ranije započinje s formalnim obrazovanjem govore da ove zadatke mogu uspješno rješavati i ranije (već u dobi od 4;9; Muter, Hulme, Snowling i Stevenson, 2004). U prilog tome govore i neke studije na odraslim ispitanicima koji nisu usvojili vještine čitanja i pisanja (Morais, Cary, Alegria i Bertelson, 1979) te stoga do odrasle dobi nisu na odgovarajući način ovladali fonemskom svjesnošću. Rezultati ovoga istraživanja u skladu su s nalazima o slijedu razvoja fonemske svjesnosti kod ispitanika koji ovladavaju pismima u jezicima s u netransparentnom i transparentnom ortografijom (Lyytinen i sur., 2007).

Iz rezultata faktorske analize usmjerene na strukturu fonološke svjesnosti u hrvatskom jeziku, dobivena su dva faktora koja pokazuju odijeljenost plitke (slogovne) fonološke svjesnosti i duboke (fonemske) svjesnosti. Rezultati faktorske analize na varijabli rime (prepoznavanje i proizvodnja) upućuju na to da se rima podjednako raspodjeljuje na oba faktora: slogovnu svjesnost i fonemsku svjesnost. Čini se da rima u predškolskom razdoblju predstavlja svojevrsnu sponu u razvoju od fonološkog prema fonemskom. Prema Bryant, Maclean, Bradley i Crossland (1990) rima uključuje jedinice koje Treiman (1987) naziva intrasilabičkim, a koje su, s obzirom na veličinu, negdje između sloga i fonema. Primjerice, dijete koje još nema usvojenu fonemsku svjesnost može raspoznati ne samo da se *muž* i *puž* rimuju nego i da imaju vrlo sličnu fonemsku strukturu. Takvo fonemsko raspoznavanje može olakšavati vidno prepoznavanje cjelina u počecima čitanja i udruženo s njim pridonijeti fazi prijelaza i izdvajanja obilježja alfabetskoga koda (Frith, 1986).

Poznavanje slova, prema nizu autora, najbolji je pojedinačni prediktor početnoga čitanja iz predškolskoga razdoblja (McBride, Chang, 1999). Rana istraživanja o povezanosti

fonološke svjesnosti i poznavanja slova upućuju na podatak da poznavanje slova može olakšati vizualno prepoznavanje riječi (McGee, Lomax, Head, 1988). Poznavanje slova uključuje dva temeljna znanja: grafički oblik i ime slova, a u jezicima dubinske ortografije tu je još i izgovor glasova (Foulin, 2005). Novija istraživanja naglašavaju važniju ulogu poznavanja slova posebice ističući njihovu važnu ulogu u promoviranju fonološki utemeljenih strategija čitanja. Povezujući nalaze ranijih i kasnijih istraživanja, sve se više ističe uloga poznavanja slova kao poveznice između vizualne i fonoloških strategija, odnosno strategija koje vode prema fonemu, a što se događa u prijelazu iz razdoblja predalfabetske u alfabetsku fazu čitanja (Frith, 1986).

Bolje poznavanje velikih slova u skladu je s nalazima malog broja istraživanja koja navode isti podatak u razdoblju rane pismenosti, ali i tijekom razdoblja početnoga čitanja (Smythe i sur., 1970-71). Razlozi se vežu uz vizualnu jednostavnost i različitost velikih formalnih slova, odnosno uočljivost vizualnih razlikovnih obilježja, njihovu češću pojavnost u okruženju u kojem djeca borave (Ellefson i sur, 2009), uporabu u smislu isticanja i usmjeravanja na korištenje od strane odraslih i početke njihova poučavanja još u samom djetetovom domu (Worden i Boettcher, 1990).

Provedena faktorska analiza na varijabli velika slova jasno odjeljuje dva faktora - prvi faktor uključuje slova koja su lakša za raspoznavanje posebno prema vizualnim obilježjima pa se stoga ranije tim slovima i ovladava. To su slova koja su prisutna u svim alfabetskim jezicima i ona su danas, na način koji uključuje sva velika formalna slova, lako dostupna djeci: od reklama, plakata, raznih formalnih natpisa u okružju i u medijima do ciljane izloženosti u predškolskim programima. Drugi faktor predstavljaju slova osobita za hrvatsku latinicu (slova s dijakritičkim znakovima i digrafi: *č, ć, đ, š, ž, lj, nj, dž*). Istraživanja u hrvatskome jeziku pokazala su da su djeci upravo slova koja strukturiraju drugi faktor i u formaliziranom procesu početnoga čitanja problematična (Pavličević-Franić, 2005), a posebne teškoće predstavljaju djeci kojoj hrvatski nije materinski jezik (Cvikić, Kuvač, 2003).

Kod malih formalnih slova raspodjela strukture također ide u dva faktora, no nije tako jasna kao što je to u faktorskoj distribuciji velikih tiskanih slova. Isti zaključak navode i Smythe i sur., (1970-71) za dubinsku ortografiju: *No clear-cut evidence of alphabet sequence or position effect is apparent in the melange that define this factor* (str. 31). Mala formalna slova koja pripadaju prvom faktoru uglavnom su ona koja sliče svojim ekvivalentima u velikim formalnim slovima. Prvom faktoru pripadaju čak i slova koja imaju jednaki oblik kao u velikim formalnim oblicima, ali i dijakritičke oznake (npr. *č, ć, š, ž*), a što može upućivati na generalizaciju oblika i zanemarivanje perceptivnih oznaka. Drugom faktoru pripadaju slova koja su temeljem vizualnih razlikovnih obilježja najteže uočljiva i djeca njima ovladaju posljednjima (*b, d, f, g, h, l*). Grafička nespecifičnost u smislu teškog razlikovanja ovih malih formalnih slova (u odnosu na ranije poznate oblike (*l - I*) ili opcije poput *b-d*) može bit jedan od razloga koji uvjetuje duže ovladavanje ovim simbolima. Slova koja pripadaju drugom faktoru kao što su *b, f, g, h* predstavljaju glasove koji su rjeđi u govornom jeziku (Vuletić, 1990,

Kuvač Kraljević i sur., u tisku). Ovakvi nejednaki omjeri velikih i malih slova na dva faktora, čiji udjeli nisu jednaki ni u smislu jakosti njihova definiranja, upućuje na različite procese koji operacionaliziraju usvajanje malih i velikih slova.

Faktorska analiza na varijablama fonološka svjesnost i poznavanje slova potvrđuje pretpostavku o višefaktorskoj strukturi tih varijabli u razdoblju rane pismenosti u hrvatskome jeziku. Konačno, rezultati potvrđuju i pretpostavku o pozitivnoj korelaciji između poznavanja slova i fonološke svjesnosti u predškolskom razdoblju. S obzirom da niz istraživanja izdvaja fonološku svjesnost i poznavanje slova kao najznačajnije pretkazatelje čitanja i pisanja, opravdano je očekivati njihovu povezanost u razdoblju rane pismenosti. Ipak, najveća je korelacija dobivena između poznavanja slova i fonemske svjesnosti što ide u prilog već potvrđenoj vezi slovo-glas, odnosno povezanosti glasova u riječi i slova kojima se ti glasovi grafički predstavljaju u pisanom jeziku.

Zaključak

Brojna istraživanja upućuju da pojedinci i društvo dugoročno imaju velike koristi od visokokvalitetnoga ranog obrazovanja (Bowman, Donovan i Burns, 2000). Kvaliteta podrazumijeva stvaranje standarda koji trebaju osigurati dobre ishode u domeni rane pismenosti, a što se postiže i kroz točno i jasno određen kurikul i osiguravanje kompetencija onih koji ga trebaju provesti. Standardi i kurikuli usmjereni na ranu pismenost trebaju imati okosnicu u jeziku, svjesnosti o tisku i izranjajućoj pismenosti. Osobe i institucije odgovorne za obrazovanje u ranom djetinjstvu moraju pažljivo razmotriti svako od područja, a posebno pitanja vezana uz istaknute segmente - kao što su to fonološka svjesnost i poznavanje slova, odnosno alfabetski kod (Strickland i Riley-Ayers, 2006).

Motivacija za ovim radom upravo proizlazi iz nedostatnih podataka o prirodi fonološke svjesnosti i poznavanja slova u hrvatskome jeziku kao jeziku transparentne ortografije kao i zbog nedostatnih podataka o predvještinama čitanja i pisanja koje imaju prediktivnu vrijednost za kasnije čitanje i pisanje. U tom smislu ovo istraživanje pruža prve takve podatke o predvještinama čitanja i pisanja u hrvatskome jeziku.

Provedena faktorska analiza fonološke svjesnosti i poznavanja slova potvrđuje pretpostavku o višefaktorskoj strukturi obiju varijabli - fonološke svjesnosti i poznavanja slova - u razdoblju rane pismenosti.

Nalazi dobiveni ovim istraživanjem imaju implikaciju na oblikovanje predškolskoga kurikula usmjerenog na razvoj vještina pismenosti. Primjerice, rezultati upućuju na:

a) važnost kombiniranja zadataka kojima se potiču implicitne i eksplicitne razine fonološke svjesnosti - razvoj fonološke svjesnosti mora biti potican od većih prema manjim jedinicama
b) važnost uključivanja aktivnosti koje uključuju rimu u cilju poticanja fonemske svjesnosti
c) smjer ovladavanja fonemskom svjesnosti od vještine stapanja prema vještini raščlanjivanja
d) redoslijed učenja slova - slova koja su obuhvaćena prvim faktorom su ona koja bi djeca trebala usvajati prvima.

Svi ovi podatci mogu biti od posebne važnosti ne samo za osiguravanje dobrog napretka u čitanju i pisanju kod djece urednoga razvoja, već trebaju biti posebno korišteni u planiranju prevencije i intervencije kod one djece koja su rizična za teškoće u čitanju i pisanju. Stoga je u programima važno točno odrediti koja jezična znanja i u kojem opsegu djeca trebaju svladati kako bi mogla usvajati čitanje i pisanje (vidi Bežen, Budinski i Kolar Billege, 2013), kakva iskustva s pisanim materijalima trebaju imati, što trebaju sadržavati radni materijali za poticanje rane pismenosti i kako mjeriti status rane pismenosti i napredak (Kolar Billege, 2015).

Hrvatskom obrazovnom sustavu potrebni su programi koji bi osigurali navedene standardne ishode, posebno u domeni jezičnih pretkazatelja pismenosti, ali i informacije o načinima poticanja rane pismenosti u kućnom okruženju, odnosno okolini u kojoj se dijete nalazi. Ne manje važni su i podatci o kompetencijama osoba koje su uključene u rano obrazovanje – odgajatelja. Podizanje njihovih kompetencija može pridonijeti kreiranju osobitih programa prilagođenih manjim skupinama, a u skladu s općim načelima važnima za ranu pismenost uz podržavanje obiteljske, kulturološke i geografske raznolikosti.