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## THE PREDICTIVE INFLUENCE OF INTELLIGENCE AND COMMUNICATIVE LANGUAGE ABILITY ON SCHOOL ACHIEVEMENT

**Abstract:** Although numerous studies show that intelligence, measured by various tests, is a significant predictor of school achievement, this cognitive variable can only explain about 50% of the variance. It is also known that communicative language ability represents an important basis for learning subject content in the early period of formal education. One of the most comprehensive models of language ability (Bahman, Palmer, 1996), in addition to strategic knowledge, includes language knowledge that includes organizational language knowledge (grammatical and textual) and pragmatic language knowledge. Although the non-cognitive factors de facto participate in the explanation of school success, the aim of the research presented in this paper was to determine the predictive influence of intelligence and communicative language ability, i.e. organizational and pragmatic language knowledge on differences in school achievement in Serbian, English and Mathematics at the end of the first half of the fifth grade. The research was conducted on the sample of 197 fifth-grade students (51% girls, average age 11.5 months) in elementary schools in Loznica. The authors of the paper applied an adapted form of the test of communicative language abilities that was applied in research in a bilingual context (Šimonji-Černak, 2005). Revisk was used to test verbal and manipulative intelligence (Biro, 1997). We started from the assumption that organizational language knowledge, has a more significant predictive influence on differences in school performance in the above-mentioned subjects than intelligence. Hierarchical regression analysis model determined that the predictor variables of organizational language knowledge explain 36.8% - 49.4% of the variance in school achievement, while the intelligence variables are related to the achievements in Serbian and Mathematics and explain 0.6% - 3% of the variance. A significant partial contribution of pragmatic knowledge and knowledge of verbs as an element of grammatical language knowledge were determined in all three subjects, as well as the contribution of knowledge of grammatical rules only in the Serbian language. The results confirm the hypothesis and indicate that for success in the mother tongue, foreign language and mathematics it is important to develop grammatical knowledge, and pay special attention to the importance and strategies of developing pragmatic language function in the period of early formal education.

Key words: communicative language ability, intelligence, school success, early formal education.

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## Introduction

The importance of education in modern society and the importance of student success in primary schooling for further advancement through the education system has led to a great interest of researchers in predicting and explaining school success. School achievement can be operationalized as the degree of realization of teaching goals (Kadum-Bosnjak, Persic, & Brajkovic, 2007), which is determined through the results of knowledge tests, results on standardized achievement tests and and which is expressed through school grades (Pintrich, 2003). School achievement is defined as both declarative and procedural knowledge from various school subjects, the acquisition of which is connected with opportunities for learning during the classes. The canonization of knowledge can result from the curriculum and recently from educational standards, too. (Koller & Baumert, 2008: 735, according to Bozin, Milatovic, 2009).

Knowledge tests explain about 16% of the variance in overall school success, but still a large percentage of the variance remains unexplained (Tanilon, Vedder, Segers, & Tillema, 2011). A certain number of researchers believe that the grade from an individual subject is a better criterion of achievement than the overall school success (Petska, 2006) which is actually the sum of the grades of all individual subjects that differ considerably in their content and requirements (Furnham & Mosen, 2009). It should be also considered that there are different grading and criteria systems in schools (Rosander, 2012).

Even though psychometric intelligence is an indicator of a person's ability, it predicts success in the real world with high accuracy and represents significant determinant of academic, as well as professional, achievements (Deary, Strand, Smith, & Fernandes, 2007; Laidra, Pullmann, & Allik, 2007; Rhode & Thompson, 2007).

Intelligence consistently proves to be the best independent predictor of school and academic success, especially during the elementary school (Bracken & Walker, 1997; Laidra, Pullmann, & Allik, 2007) but rarely explains more than 50% of the variance in success (Chamorro-Premuzic & Furnham, 2008, Kaufman & Lichtenberger, 2005; Neisser et al., 1996), which undoubtedly indicates that, apart from cognitive ability, there are other factors that influence individual differences in school performance.

The correlation of intelligence test results with academic performance has been confirmed by numerous research papers, and it is usually in the range of moderate to strong correlation (Dodonova & Dodonov, 2012), more precisely from .3 to .7 (De Fruyt, Van Leeuwen, De Bolle, & De Clercq, 2008). The average correlation between IQ and grades is about .50 (Chamorro-Premuzic & Furnham, 2005; Jensen, 1980; Laidra et al., 2007; Lu, Weber, Spinath, & Shi, 2011). Specific measures of intellectual abilities can explain greater variability of success in individual school subjects than it is possible with measures of the general factor of intelligence and general school success (Babarovic, Burusic, & Sakic, 2010), which can explain between 10 and 25% of the variance of school success (Gottfredson, 2002; Rohde & Thompson, 2007).

It has been confirmed that cognitive ability is a better predictor of success in Mathematics and other scientific subjects than in language subjects, and much better than that in artistic subjects such as Music and Art (Deary, Strand, Smith, & Fernandes, 2007). According to the research conducted by Halama and Tomkova (2005), verbal intelligence, that is, verbal-logical thinking, is the strongest predictor of school achievement.

A research conducted in Croatia, determined that verbal communication skills are associated with success in language subjects, while a combination of verbal and numerical abilities is necessary for general success in school and social subjects, although verbal abilities still play a more significant

role (Pavlicevic-Franic & Aladrovic-Slovacek, 2007). However, all three types of abilities are almost equally related to success in Mathematics and scientific group of subjects (Bennett, Seashore, & Vesman, 2005).

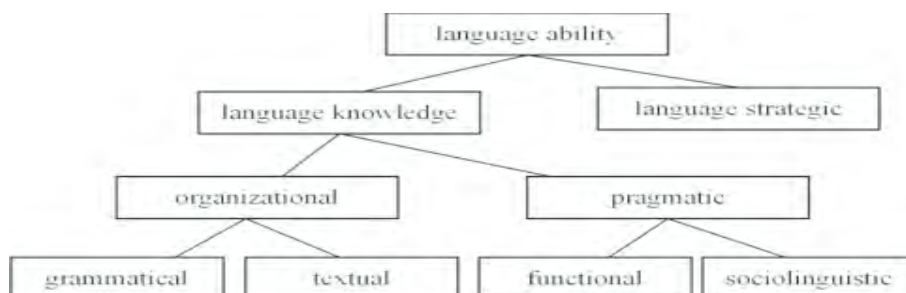
It is important to note that considering only one isolated determinant of school achievement is always closely related to the danger of careless and wrong interpretations and wrong specifications (Helmke & Schrader, 2006: 83, according to Bozin & Milatovic, 2009). On the other hand, it is difficult to cover so many different determinants of school achievement in one research. In our paper, we therefore decided to determine the predictive influence of communicative language competence, in addition to intelligence, which we operationalize through the verbal and manipulative score as a predictor of school achievement, on success in the language area (Serbian as a native language and English as a foreign language) and Mathematics, guided by the finding that higher variability of success in certain school subjects can be explained by specific measures of intellectual abilities (Babarovic, Burusic, & Sakic, 2010). We decided to examine only the predictive influence of variables on mathematical achievement in addition to language subjects, because, as is known, mastering mathematical operations, in addition to numerical and other abilities, necessarily requires understanding the text.

### **Communicative language ability: an attempt to define the concept**

Communicative language ability, both oral and written, is important for acquiring and transferring knowledge in the broadest sense (Trumbul & Paheko, 2005). Language is essential to achieve interaction in the classroom. It facilitates the exchange of information, but at the same time improves language skills and cognition, which contributes to successful communication, (Gibbons, 2002, Hawkins, 2000; Nomlomo, 2010). The development of language competences helps students master general communication skills. It also facilitates the acquisition of various contents and directly influences their acquisition. Language competences and their development are therefore important not only for learning the mother tongue, but also for acquiring other knowledge during the teaching process (Pavlicevic-Franic & Aladrovic, 2009). Some researches (Wellington & Osborne, see Nomlomo 2010) show that the development of language competence contributes to better school achievement. Therefore, it is important to give students the opportunity to improve their language skills and to think about teaching methods and strategies that encourage their development (Tedik, Jorgensen, & Geffert, 2001)

Language is a complex and dynamic system of generally accepted symbols that we use to express our thoughts, feelings, ideas and experiences, that is, to communicate with others (Goldstein, 2011). Unlike the expressive function (thoughts, emotions, or intentions), the receptive function is related to understanding what is said or understanding the meaning. Language is also an important means of thinking. Vygotsky (1983) argues that inner speech is used to organize, direct and control thinking. Language is also used as a means of learning about the world around us, about people, events and facts. Therefore, the function of acquiring knowledge and experience is significant, especially when it comes to school learning and acquiring knowledge. This function is often realized by connecting spoken information with information of immediate experience, but also with higher levels of thinking. Language cannot be considered in isolation from knowledge. According to Piaget, knowledge enables learning in general, including language learning, where language is a means of thinking, that is, thinking about reality (Piaget, 1977b). Therefore, it is necessary to bear in mind that in the early period of language learning, the child is in a concrete operational phase and that he should therefore be taught using examples from everyday communication. Sociolinguistics emphasizes the importance of the environment in which a child grows up for language acquisition and learning, and therefore it is necessary that all participants in the institutional environment introduce elements of a communicative-functional approach in order to develop students' communicative competence (Hymes, 1974).

The term communicative competence is still one of the most controversial terms in the field of general and applied linguistics. Noam Chomsky (1965) defines competence as a system of linguistic knowledge possessed by native speakers of a language. It differs from linguistic performance, which is the way in which the linguistic system is used in communication. In the context of modern approaches to language acquisition, Hymes (1984) introduced the concept of competence for use in the field of applied linguistics, which was later transformed into communicative ability or communicative competence, considering it the most important element of early language acquisition. This means that priority is given to the development of communicative competence, regardless of possible grammatical errors (Pavlicevic-Franic & Aladrovic-Slovacek, 2007). In the late 1980s, Bachman and Palmer proposed one of the most comprehensive models of communicative competence, more precisely, communicative language ability. That model, however, was slightly modified in the mid-1990s (Bachman & Palmer, 1996).



**Picture 1.** Language proficiency model of Bachman and Palmer (1996)

They define two broad areas of language knowledge – organizational knowledge and pragmatic knowledge, which complement each other in achieving communicatively effective language use. Organizational knowledge consists of abilities that deal with the control of formal language structures, that is, grammatical and textual knowledge. Grammatical knowledge includes knowledge of vocabulary, morphology, syntax, phonology and graphology. Textual competence implies knowledge of conventions necessary for linking two or more statements in order to form a text which is the basic unit of language, spoken or written, consisting of two or more statements or sentences structured according to the rules of cohesion and rhetorical organization.

Pragmatic competence deals with the relationship that exists between language user/speaker and context. Pragmatics refers to the empirical domain that consists from conventional language rules and their manifestations in production and interpretation of statements (van Dijk, 1977) and contributes to the analysis of the conditions that the speakers of the given language make some statement acceptable in particular situations. The notion of pragmatic competence includes illocutionary competence that represents the ability to adequately produce and understand utterances in a particular context and sociolinguistic competence, which represents knowledge of sociolinguistic conventions for performing language functions in an acceptable way in a given context.

Bachman and Palmer also included strategic competence in the model. It is described as a set of metacognitive components that enable language users to engage in goal setting, evaluation of communicative resources, and planning (Bachman, 1990, Bachman & Palmer, 1996, 2010; Cohen, 1994). Bachman and Palmer view strategic competence as a component of ability, thus becoming a general cognitive ability with a very significant role as a mediator between intentions, fundamental competences, cultural knowledge and the context of language use. It has a central place in the communicative use of language (Skehan, 1998; Bagaric Medve, 2012).

According to the authors of this paper strategic competence is a completely separate element of communicative language ability which has the executive function of making a final decision (of many possible options) about what will be said and in what way, as well as about other productive and receptive means of achieving and conveying meaning. We have not included it in the research paper, since it includes language user/speaker characteristics that enable him to examine the situation in which the interaction is taking place, plan an adequate response to the given situation and implements his plans keeping in mind the changing dynamics of the context. We concluded that it would exceed the scope of this research, but it would also represent an important parameter in future researches.

### **The importance of communicative language ability for teaching and learning**

Although communication in the mother tongue is the primary competence for lifelong learning, which is a prerequisite for the development of other key competences (communication in foreign languages, mathematical literacy, media (digital) competence, "learning to learn" competence, interpersonal competence, entrepreneurial competence, creative expression (European Commission, 2005), research on communicative competence is mainly focused on the acquisition of a foreign language (Olanipekun, 2013; Markovic & Marosan, 2011, Safranjan, 2009).

There are several studies focused on communicative competence in the mother tongue in Croatia (Aladrovic-Slovacek & Pintar, 2013; Pavlicevic-Franic & Aladrovic-Slovacek, 2007). The development of communicative competence is considered one of the goals of teaching the Croatian language in the early period (up to the age of 12 when the child is in the concrete operational phase, Piaget 1977a). These studies confirm that the teaching method affects the development of communicative competence, since the respondents whose language teaching included elements of humanistic education and communicative-functional approach, especially elements of didactic games, showed better results in tests of communicative competence and greater motivation for the subject, as well as more positive attitudes (Aladrovic-Slovacek & Pintar, 2013). Students whose teachers applied creative and research teaching methods performed better in functional tasks (Cesi & Barbarosa-Sikic, 2007). However, the research results show that elementary school students in Croatia are more familiar with language theory than its application in everyday situations, because some teachers still do not apply adequate teaching methods and insist on knowledge of theories and facts, and are less concerned about the development of language activities in the Croatian language teaching (Pavlicevic-Franic & Aladrovic-Slovacek, 2007)

The results of this research also indicate the importance of developing listening, speaking, reading and writing skills at the beginning of schooling, which encourages the development of language competence. However, while in preschool the dominant activities are listening and speaking, in the first grade the acquisition of reading and writing begins, i.e., a process that is extremely significant because it also affects the acquisition of basic elements of linguistic competence, such as e.g. orthographic, grammatical, lexical norm. The authors of the paper take into account the fact that the basis of language is mostly acquired by the age of five or six, but language development does not stop there. At the beginning of schooling, by including the child in the processes of institutional learning not only of the mother tongue, but also of other contents, the functional use of the language changes at an early age and a new linguistic organization occurs conditioned by more mature cognitive and linguistic stages of development. Therefore it is necessary to develop this ability from the very beginning of schooling. A linguistically competent student will have fewer problems reading and understanding what he has read, will be able to express himself more easily in oral and written communication, will be more successful in verbalizing his thoughts and attitudes, and will therefore achieve better academic achievement. It is for this reason that language competences and their development are important not only for learning the mother tongue, but also for the acquisition of other knowledge during the teaching process.

Taking into account the fact that so far no research has been done in the Serbian-speaking area that focused on the importance of communicative competence in the mother tongue (according to the author's knowledge), this research aims to determine the predictive influence of communicative language ability (competence) in the Serbian language on academic achievement in Serbian, English and Mathematics, after completing the first cycle of education.

Since intelligence has been shown to be a reliable predictor and significant determinant of academic (as well as professional) achievements, intellectual variables were also included in our research as predictors.

We assumed that communicative language ability is a significant predictor of school achievement (more significant than intelligence), when it comes to language group subjects of, but also Mathematics.

## Metod

### Sample and procedure

The sample consisted of 197 fifth-grade students (51% girls), average age 11 years and 5 months, who attended three elementary schools in the territory of the city of Loznica. By the end of the first term, students were tested with a language test, in groups, during Serbian language classes. The test lasted about 20 minutes. Data on the school achievement of students in Serbian, English and mathematics, on the gender of the student and the education of the parents were collected according to the school documentation at the end of the first term. At the end of the fourth grade, the school psychologist tested the intelligence of the pupils.

### Instruments

Communicative Language Ability Test (CLAT): an adapted form of the test used in the investigation of communicative and cognitive language competence of students who have changed the language of instruction (Shimonji-Chernak, 2005). It includes five groups of language tasks: use of language in a communicative context, use of verbs, use of adjectives, knowledge of basic grammar rules, understanding and adequate use of vocabulary.

In order to examine the ability to use language in communication, the task of incomplete dialogue when buying cinema tickets was a way of checking pragmatic knowledge of the language. The maximum number of points on this subtest is nine.

The correct use of verbs and adjectives was tested according to the correct choice of an individual verb/adjective from the given list, as well as according to its adequate semantic use and grammatical form. For example: Whenever I offend someone \_\_\_\_\_ I (I'm sorry); Mark has many friends. He is \_\_\_\_\_ friendly). The tasks consist of six items, and the total score for these two subtests is twelve.

Knowledge of basic grammar rules was checked based on nine sentences. The subjects had to decide whether the sentences were grammatically correct or incorrect, for example: This is incomprehensible. The maximum score on this subtest is nine.

In the tasks that examined the use of adjectives, verbs and grammatical (ir)regularities, grammatical knowledge was examined as a segment of organizational language knowledge.

The next task examines the use of vocabulary in a defined context and examines knowledge of the language of the text as the second segment of knowledge of the language of the organization. The respondents had to complete the given sentences - a New Year's greeting and a birthday invitation. The maximum number of points on this subtest is eight.

The total score on the Communicative Language Skills Test is 38.

**Revisk:** Test for measuring child intelligence (Biro, 1997) was applied at the end of the fourth grade to determine the intellectual abilities of the examinees. In addition to the overall TIQ, the Revisk test may also obtain data on achievement in certain subtests based on which the verbal (VIQ) and manipulative intelligence quotient (MIQ) are calculated. They are used as a variable predictor, in addition to the language knowledge variable. The average score of examinees at the verbal scale is VIQ = 112, at the manipulative MIQ = 117, while TIQ = 113, indicating that the examinees are above-average (bright-normal) by Wechsler's intelligence classification.

**School Achievement:** To determine the school achievement in the Serbian language, English language and Mathematics, grades from the V-class first term were taken into account.

The average grade in Serbian language was 4.09; in English 3.92 and in Mathematics 3.65.

### Results

**Table 1.** The average score on Language tasks of Communicative Language Ability Test

Language tasks of Communicative Language Ability Test (CLAT)	AS	SD	Max
Pragmatic linguistic knowledge	7.66	1.938	9
Verbs subtest	5.16	1.543	6
Adjectives subtest	4.69	1.492	6
Grammar rules knowledge subtest	5.48	1.643	9
Vocabulary/textual language knowledge subtest	7.36	2.065	8

As can be seen in table 1, the average score on the subtest of pragmatic linguistic knowledge, where max = 9, M = 7.66; SD = 1.938, on verbs subtest (max = 6) M = 5.16; SD = 1.543, on adjectives subtest (max = 6); = 4.69 M; SD = 1.492, on grammar rules knowledge subtest (max = 9), M = 5.48; SD = 1.64, and on vocabulary/textual language knowledge subtest, where max = 8; M = 7.36; SD = 2.065. The lowest average achievement in relation to the maximum score is at the grammar rules subtest. No differences were found in the average scores on the subtests of language knowledge in relation to gender and parent education.

### Predictiveness of intelligence and communicative language ability/competence to school achievement

In the further course, the hierarchical linear regression analysis was applied, which determined the contribution of the communicative language (organizational and pragmatic) knowledge that represents the predictor of variables in the differences in school achievement in the above-mentioned school subjects (criterion variables) over the intellectual abilities of the examinees. Table 2 shows the results of the predictive impact analysis of the mentioned variables on the differences in the Serbian language achievement.

**Table 2.** Predictive impact analysis of the variables on the differences in the Serbian language achievement

Predictors	Step 1 ( $R_1^2=.030$ )		Step 2 ( $R_2^2=.524$ )	
	$\beta$	$p$	$\beta$	$p$
VIQ	.185	<.05	.085	.178
MIQ	-.021	.809	-.016	.799
Dialogue	-	-	.386	<.001
Verbs	-	-	.254	<.001
Adjectives	-	-	.106	.081
Grammar	-	-	.174	<.05
Vocabulary	-	-	-.045	.476

Notes: Criteria – grade in Serbian Step 1 = intellectual abilities (Revisk) are predictors; Step 2 = intellectual abilities (Revisk) 2008) + elements of language knowledge are predictors.  $R_1^2$ = coefficient of determination in the first step;  $R_2^2$ = the coefficient of determination in the second step.  $\beta$  = standardized regression coefficient.  $p$  = level of statistical significance.

Predictor variables were introduced into the model in two steps: the intellectual abilities of the examinees were the predictor of a school achievement variable in the first step. This set of variables has no significant impact on the differences in school achievement in Serbian ( $R = .073$ ;  $p = .052$ ). Multiple determination coefficient  $R_1^2 = .030$  showed that intellectual abilities explain only 3% of the variance of school achievement in Serbian. By analyzing partial contributions, a significant contribution of verbal intelligence ( $\beta = .185$ ;  $p < .05$ ) was found before the model introduced predictors from a set of communicative language knowledge variables. By introducing this set of variables that significantly affect the differences in Serbian language achievement ( $R = .724$ ;  $p < .001$ ), an additional contribution of  $\Delta R^2 = .494$  was established. Thus, the variables of communicative language knowledge explained 49.4% of the variance of school achievement in Serbian, and together with the variables of intelligence they explain 52.4% ( $R^2 = .524$ ). A significant partial contribution of pragmatic language knowledge ( $\beta = .386$ ;  $p < .001$ ) was found in the set of communicative language knowledge variables, followed by the partial contribution of verbs ( $\beta = .254$ ;  $p < .001$ ) and basic grammar rules ( $\beta = .174$ ;  $p < .05$ ).

Hierarchical regression analysis with the same predictor variables was applied to the achievement in English (Table 3).

**Table 3.** Predictive impact analysis of variables on the differences in the English achievement

Predictors	Step 1 ( $R_1^2=.006$ )		Step 2 ( $R_2^2=.480$ )	
	$\beta$	$p$	$\beta$	$p$
VIQ	.082	.354	-.025	.707
MIQ	-.012	.894	-.012	.854
Dialogue	-	-	.497	<.001
Verbs	-	-	.220	<.001
Adjectives	-	-	-.055	.386
Grammar	-	-	.064	.315
Vocabulary	-	-	.077	.243

Notes: Criteria-grade in English. Step 1 = intellectual abilities (Revisk) are predictors; Step 2 = intellectual abilities (Revisk) 2008) + elements of language knowledge are predictors.  $R_1^2$ =the coefficient of determination in the first step;  $R_2^2$ = the coefficient of determination in the second step.  $\beta$  = standardized regression coefficient.  $p$  = level of statistical significance.



Intelligence variables do not significantly contribute to English language achievement ( $R = .076$ ;  $p = .569$ ) and explain only 0.6% of dependent variables ( $R^2 = .006$ ). The predictive influence of the variables of communication language knowledge is significant ( $R = .693$ ;  $p < .001$ ). This set of variables is further explained by 47.4% of the English language variance ( $\Delta R^2 = 0.474$ ). A significant partial contribution to pragmatic language knowledge ( $\beta = .497$ ;  $p < .001$ ) and the knowledge of the verb as an element of organizational language knowledge ( $\beta = .220$ ;  $p < .001$ ) has been established.

Hierarchical regression analysis was performed to determine predictive influence of intelligence and communicative language variables on the criterion variable – school achievement in Mathematics (Table 4).

**Table 4.** Predictive impact analysis of the variables on the differences in the Mathematics achievement

Predictors	Step 1 ( $R^2 = .023$ )		Step 2 ( $R^2 = .391$ )	
	$\beta$	$p$	$\beta$	$p$
VIQ	.182	<.05	.093	.194
MIQ	-.069	.432	-.068	.334
Dialogue	-	-	.366	<.001
Verbs	-	-	.153	<.05
Adjectives	-	-	.126	.068
Grammar	-	-	.073	.291
Vocabulary	-	-	.049	.487

Notes: Criteria-grade in Mathematics. Step 1 = intellectual abilities (Revisk) are predictors; Step 2 = intellectual abilities (Revisk) 2008 + elements of language knowledge are predictors;  $R^2$  = the coefficient of determination in the first step;  $R^2$  = the coefficient of determination in the second step.  $\beta$  = standardized regression coefficient.  $p$  = level of statistical significance.

Intelligence variable explains only 2.3% of the variance of grade in Mathematics ( $\Delta R^2 = .023$ ) and the variables of communicative language knowledge explain 36.8% ( $\Delta R^2 = 0.023$ ). Significant partial contribution of verbal intelligence ( $\beta = .182$ ;  $p < .05$ ) has been established, before the variables of communicative language knowledge were introduced in the model. Their influence is significant ( $R = .625$ ;  $p < .001$ ), and partial contributions of pragmatical language knowledge ( $\beta = .366$ ;  $p < .001$ ) and knowledge of verbs as an element of organizational language knowledge ( $\beta = .153$ ;  $p < .05$ ) are significant, too.

### Discussion of the results

Based on the results of the conducted research, it can be concluded that communicative language knowledge/ability (considered as competence) is a significant predictor of achievement in Serbian, English and Mathematics at the end of the fourth grade. These findings are in line with the results of the research conducted by Wellington (Wellington & Osborne, see Nomlomo 2010), which emphasizes that communicative language competence affects not only the acquisition of the mother tongue, but also the acquisition of other knowledge. The predictor variables of language knowledge explain as much as 36.8% of the variability of achievement in Mathematics, 47.4% of the variability of achievement in the English language and 49.4% of the variability in the Serbian language. If we look at the contribution of the predictor variables of intellectual abilities, we will see that it is much smaller, that it ranges from 0.06 - 3%, and that only the partial contribution of verbal intelligence is statistically significant for achievement in Serbian language and Mathematics (not for achievement in English language). Although the results of the research confirm the significant contribution of verbal intelligence to school achievement, at least when it comes to the Serbian language and Mathematics, which is in accordance with the results of some researches (Halama & Tomkova, 2005), they also speak in favor of the significant contribution of communicative language competence to school achievement, in all school subjects which are included in the research, which confirms the hypothesis. Taking into account that it is an early period of formal education, the

results indicate that it is necessary to develop communicative language skills as early as possible, both when it comes to oral and written production, because this ability is important for the acquisition and transmission of knowledge in the broadest sense, and not only in the sense of developing verbal abilities and communication skills.

If we analyze the partial contributions on tasks that measure organizational language knowledge, we see that there is a statistically significant contribution of knowing verbs to achievement in all three subjects covered by the research, which can be linked to the role of verbs as a carrier of meaning in a sentence and easier and more successful understanding of the text, assignment or instructions (depending on the subject).

The results of the research also point to the fact that if students have developed organizational language skills, they master the content more successfully and achieve better results on knowledge verification tests, which are expressed through school grades, so it can be concluded that organizational language knowledge represents a significant basis for learning the content of the subject in early period of formal education.

Knowledge of grammatical rules as the second segment of knowledge of the organizational language is a significant predictor of school achievement only in the Serbian language, although its transfer to the area of the second language was expected, which can be partially explained by the design of the tasks in this subtest, which are designed to "cover" certain subject areas of the Serbian language, so it is possible that the variances between the predictor and criterion variables overlap.

Achievement in the task that tested textual knowledge (New Year's greeting card and birthday invitation) within the framework of the correct use of lexical items did not prove to be a significant predictor of school achievement in any school subject. Although some authors (Celce-Mursia, 1995) believe that Bachman's model should be modified and lexical knowledge should be in the pragmatic area, the results of this research showed that the organization of discourse in accordance with a predefined form is not a significant factor in school achievement. The nature of communicative competence is dynamic, not static, and in this task the register is defined in a social and cultural context, so it can be assumed that the emphasis was not on functional but on sociolinguistic knowledge.

Achievement in the task that examines communicative discourse (pragmatic language knowledge) significantly contributes to differences in school achievement in all subjects examined. It is known that encoding verbs and knowledge of phonological, morphological and syntactic rules are necessary for the acquisition of discourse competence. Mastering the ways of mutual connection and interpretation of form and meaning to achieve meaningful integrity is of essential importance for the realization of the heuristic function that is part of the teaching and learning process (Pavlicevic-Franic, 2005). Sentences are related to meaning, but also to the essential features of the context of language use, which differs within each subject, and therefore students who have knowledge of pragmatic conventions are more successful in performing language functions and interpreting the illocutionary force which enables them to show a more successful understanding, interpretation and presentation of the teaching content, and therefore better school achievement (Pavlicevic-Franic & Aladrovic, 2009). Therefore, students with a higher level of pragmatic knowledge are able to successfully recognize whether a certain statement performs a certain function as well as its success in a given context. Knowledge of linguistic rules is necessary for the formation of syntactically properly structured sentences that adequately convey meaning, but communicative information must be connected with information of immediate perceptual experience, as well as with higher levels of thinking in the function of interpretation, as well as in the creation of discourse inclusiveness, which in this case proved to be significant factor of school learning and acquisition of school knowledge.

The main implication of the conducted research is that organizational knowledge of the language is certainly a fundamental prerequisite for acquiring language knowledge and transferring it to school achievement, and special attention should be paid to the development of pragmatic language knowledge in understanding, but also in creating meaning, expressing thoughts, ideas and attitudes and acquiring knowledge in a school context. It can be concluded that communicative competence is a complex skill that needs to be consciously developed within the educational process. It develops best when students think about the process of language acquisition and express themselves through activities that involve communication in the context of interactive teaching, where the focus is on the student who gains greater autonomy by acquiring language competences, but also control over the learning process and understanding of the teaching material, as well as the opportunities to evaluate it.

Since knowledge of grammatical rules and structures is not enough for productive language use, the teacher's role is to prepare an activity and organize teaching that does not neglect the communicative goal and the development of students' communicative competences should be systematized and planned. Exercises should reflect real-life situations and communicative contexts in which students would have the opportunity to apply the acquired knowledge of grammar and vocabulary. Also, it is very important that students develop awareness of the existence of different strategies of language learning and the possibilities of their application in solving linguistic and communicative problems. In this way, students will develop language awareness (Carter, 2003), but also autonomy in the learning process.

Therefore, it is necessary to give priority to pragmatism in relation to normativity, and the focus should be on functional linguistics, which must be adapted to the child's language experience, knowledge and learning opportunities, and not on theoretical linguistics. Teachers of the Serbian language should choose language content and ways of its formulation in a way that will enable the adoption of the standard-normative level, but which will also enable the development of pragmatic-functional competence.

### **Conclusion**

The conducted research represents an initial step in determining the predictive influence of communicative language ability in the mother tongue on school achievement in the early period of formal education, with the contribution of intelligence. Aware of the fact that consideration of only one isolated determinant of school achievement can lead to wrong interpretations and wrong specifications (Helmke & Schrader, 2006: 83, according to Bozin, Milatovic, 2009), the results of research confirming the significant predictive influence of communicative language competence on achievement in Serbian language, Mathematics, and English language, and the fact this predictor explains even 50% of the variance, will be taken into account with caution. The question arises, what would be the contribution of the variables of organizational and pragmatic language knowledge if other factors (non-intellectual, for example) were included in the model. However, our research wanted to examine the actual relationship between the contribution of intellectual abilities and communicative language competence, because it was already known that especially verbal intelligence is one of the most important factors of school achievement. Therefore, it is valuable that the results of the research showed that the contribution of the variables of organizational and especially pragmatic language knowledge are significantly higher compared to verbal intelligence.

This finding opens the way to thinking that maybe verbal intelligence and certain aspects of communicative language competence (primarily organizational language knowledge) have a certain part of the common variance, but what additionally contributes to differences in school achievement is actually pragmatic language knowledge. Based on the outline of the conducted

research, this thesis cannot be confirmed, but it would be significant to design some of the future researches in the direction of its verification.

Through the research, we have confirmed that apart from the contribution in language areas (mother tongue and foreign language), pragmatic language knowledge has a significant predictive influence on achievement in Mathematics. Also, a significant contribution of some elements of organizational linguistic knowledge, more detailed knowledge of verbs, was determined. The results indicate which segments of language knowledge should be developed in the period of early formal education in order for school success to be as high as possible, as well as the acquisition of knowledge in the further academic context, and more broadly.

Future research should be conducted on a larger sample and in wider territories and should focus on the very context of teaching and learning in the development of communicative language ability and its impact on school achievement. In addition to the satisfactory metric characteristics of the test, which was designed/adapted for research purposes, it is necessary to design a larger number of tasks aimed at testing textual knowledge as an element of knowledge of organizational language knowledge and a number of tasks devoted to testing pragmatic linguistic knowledge. Psychometric evaluation of the test should also be one of the important tasks in the future because it can represent a significant instrument for assessing competences related to school achievement and knowledge acquisition.

#### References:

- Aladrovic-Slovacek, K. i Pintar, B. (2013). Sociolingvistički i psiholingvistički aspekti razvoja komunikacijske kompetencije u ranome poučavanju hrvatskoga jezika, U: Bezen, A., i Majhut, B. (ur.), Kurikul ranog ucenja hrvatskoga/materinskoga jezika (str.17-28). Zagreb: UFZG i ECNSI.
- Babarovic, T., Burusic, J. i Sakic, M. (2010). Psihosocijalne i obrazovne odrednice skolskog uspjeha ucenika osnovnih skola: Dosezi dosadasnjih istrazivanja. *Suvremena psihologija*, 13, 235-256.
- Babarovic, T., Burusic, J. i Sakic, M. (2009). Uspjesnost predvidjanja obrazovnih postignuca ucenika osnovnih skola Republike Hrvatske. *Društvena istrazivanja*, 4-5, 673-695.
- Bahman L.F. (1990). *Fundamental Considerations in Language Testing*. Oxford: Oxford University Press.
- Bahman L.F. & Palmer, A.S. (1996). *Language Testing in Practice*. Oxford: Oxford University Press.
- Bachman, L. F., & Palmer, A. S. (2010). *Language assessment in practice*. Oxford: Oxford University Press.
- Bagaric Medve, V. (2012). *Komunikacijska kompetencija. Uvod u teorijske, empirijske i primijenjene aspekte komunikacijske kompetencije u stranome jeziku*. Osijek: Filozofski fakultet.
- Bennett, G.K., Seashore, H.G. & Wesman, A.G. (2006). *DAT za profesionalno usmjeravanje i selekciju: Prirucnik za Diferencijalne testove sposobnosti*. Jastrebarsko: Naklada Slap.
- Biro, M. (1997). *Priručnik za Revisk, Revidirana verzija, Uputstvo za zadavanje i norme*. Beograd: Centar za primenjenu psihologiju Društva psihologa Srbije.
- Božin, A. i Milatovic, V. (2009). Razumevanje atipicnog književnog teksta i skolsko postignuće. *Zbornik instituta za pedagoska istrazivanja*, 41(1), 165-179.
- Bracken, B. A., & Walker, K. C. (1997). The utility of intelligence tests for preschool children. In: D. P. Flanagan & J. L. Genshaft (Eds.), *Contemporary intellectual assessment: Theories, tests, and issues* (pp. 484-502). New York: Guilford.
- Carter, R. (2003). Language awareness. *ELT Journal*, 57(1) 64–65.
- Chamorro-Premuzic, T. & Furnham, A. (2005). *Personality and Intellectual Competence*. New Jersey: Lawrence Erlbaum Associates, Inc.

- Chamorro-Premuzic, T. & Furnham, A. (2008). Personality, intelligence and approaches to learning as predictors of academic performance. *Personality and Individual Differences*, 44, 1596-1603.
- Chomsky, N. (1965). *Aspects of the Theory of Syntax*. Massachusetts: The M.I.T Press Massachusetts Institute of Technology Cambridge.
- Cohen, A. D. (1994): *Assessing Language Ability in the Classroom*. Boston, Massachusetts: Heinle and Heinle Publishers.
- Celce-Mursia, M. (1995). Communicative Competence: A Pedagogically Motivated Model with Content Specifications Issues. *Applied Linguistics*, 6(2), 5-35.
- Cesi, M. i Barbarosa-Sikic, M. (2007). *Komunikacija u nastavi hrvatskog jezika*. Jastrebarsko- Zagreb: Naklada "Slap" i Agencija za odgoj i obrazovanje.
- Dodonova, Y.A. & Dodonov, Y.S. (2012). Processing speed and intelligence as predictors of school achievement: Mediation or unique contribution? *Intelligence*, 40, 163-171.
- Deary, I. J., Strand S., Smith P., & Fernandes C. (2007). Intelligence and educational achievement. *Intelligence*, 35, 13-21.
- De Fruyt, F., Van Leeuwen, K., De Bolle, M. & De Clercq, B. (2008). Sex Differences in School Performance as a Function of Conscientiousness, Imagination and the Mediating Role of Problem Behaviour. *European Journal of Personality*, 22, 167-184.
- European Commission (2005). *The European Framework of References for Lifetime Learning. Teaching Goals and Methods: Communicative Competence.*, <http://www.uclrc.org/essentials/goalsmethods/goal.htm>
- Furnham, A. & Monsen, J. (2009). Personality traits and intelligence predict academic school grades. *Learning and Individual Differences*, 19, 28-33.
- Gibbons, P. (2002). *Learning language, learning through language, and learning about language: Developing an integrated curriculum*. In *Scaffolding Language, Scaffolding Learning: Teaching Second Language, Learners in the Mainstream Classroom*. (pp 118-138). Portsmouth, NH: Heinemann.
- Goldstein, E.B. (2011). *Cognitive Psychology: Connecting Mind, Research, and Everyday Experience*, 3rd ed. Thomson: University of Pittsburgh, University of Arizona.
- Gottfredson, L. S. (2002). Highly general and highly practical. In: R. J. Sternberg, E. L. Grigorenko (Eds.), *The general intelligence factor: How general is it?* (pp. 331-380), Mahwah, NJ, Erlbaum.
- Halama, P. i Tomkova, E. (2005). Subtesty inteligencneho testu IST-70 ako prediktory skolskeho vykonu v roznych typoch strednych skol. U: Sarmany-Schuller, I. i Bratska, M. (Ur.), *Psychologia pre zivot - alebo ako je potrebna metanoia* (str: 511-515). Bratislava: Stimul.
- Hawkins, J., A. (2002). Symmetries and Asymmetries: their Grammar, Typology, and Parsing. *Theoretical Linguistics*, 28. 95-149.
- Hymes, D. (1974). *Foundations in Sociolinguistics: An Ethnographic Approach*. Philadelphia: University of Pennsylvania Press.
- Hymes, D. (1984). Why Linguistics Needs the Sociologist, *Social Research*, 51 (2), 461-476.
- Kadum-Bosnjak, S., Persic, I. i Brajkovic, D. (2007). Stalnost uspjeha učenika u mladim razredima osnovne škole i na prijelazu iz 4. u 5. razred. *Metodicki ogleđi*, 14, 49-66.
- Jensen, A.R. (1980). Uses of Sibling Data in Educational and Psychological Research. *American Educational Research Journal*, 17, 153-170.
- Kaufman, A. S., & Lichtenberger, E. O. (2005). *Assessing adolescent and adult intelligence* (3rd ed.). New York: Wiley.
- Laidra, K., Pullmann, H., & Allik, J. (2007). Personality and intelligence as predictors of academic achievement: A cross-sectional study from elementary to secondary school. *Personality & Individual Differences*, 42, 441-451.
- Lu, L., Weber, H.S., Spinath, F.M. & Shi, J. (2011). Predicting school achievement from cognitive and non-cognitive variables in a Chinese sample of elementary school children. *Intelligence*, 39, 130-140.

- Markovic, V. i Marosan, Z. (2011). Analiza jezičke kompetencije i potreba studenata medicine, stomatologije i zdravstvene nege u nastavi engleskog kao jezika medicinske struke, *Medicinski pregled*, 1-2, 21-24.
- Neisser, U., Boodoo, G., Bouchard, T. J., Boykin, A. W., Brody, N, Ceci, S. J., Halpern, D. F., Loehlin, J. C., Perloff, R., Sternberg, R. J., & Urbina, S. (1996). Intelligence: knowns and unknowns. *American psychologist*, 51, 77-101.
- Nomlomo, V. (2010). Classroom interaction: Turn-taking as a Pedagogical Strategy. *A Journal of Language Learning*, 26(2), 50-66.
- Olanipekun, S.S. (2013) Appraisal of Nigerian Senior Secondary School's English Language Curriculum in the Light of Modern Curriculum. *Advances in Arts, Social Sciences and Education Research*, 3, 527-532.
- Pavlicevic-Franic, D. i Aladrovic-Slovacek, K. (2007). Jezicne kompetencije učenika na početku školovanja: normativnost nasuprot pragmatičnosti. U: V. Simovic (ur.) *Zbornik RUHJ-1*, (str. 126-140). Zagreb: ECNSI i Uciteljski fakultet Sveucilista u Zagrebu.
- Pavlicevic-Franic, D. (2005). *Komunikacijom do gramatike*. Zagreb: Alfa.
- Pavlicevic-Franic, D. i Aladrovic-Slovacek, K. (2009). Psiholingvisticke i humanisticke odrednice u nastavi hrvatskoga jezika. U: Pavlicevic-Franic, D. i Bezen, A. (ur.) *Zbornik Rano ucenje hrvatskoga jezika 2*. Zagreb: Uciteljski fakultet i ECNSI.
- Petska, K.S. (2006). Using Personality Variables To Predict Academic Success In Personalized System Of Instruction. Preuzeto 05. juna, 2023, sa <http://digitalcommons.unl.edu/cehsdiss/3>
- Piaget, J. (1977a). *Intellectual Evolution from Adolescence to Adulthood*. Cambridge: Cambridge University Press.
- Piaget J. (1977b). *The development of thought: Equilibration of cognitive structures*. (A. Rosin, Trans). New York: The Viking Press.
- Pintrich, P.R. (2003). Motivation and Classroom Learning. U Weiner, I.B. (Ur.), *Handbook of psychology: Volume 7 – Educational Psychology* (pp 103-121). New Jersey: John Wiley & Sons, Inc.
- Rhode, T. E., & Thompson, L. A. (2007). Predicting academic achievement with cognitive ability. *Intelligence*, 35(1), 83–92.
- Rosander, P. (2012). *The importance of personality, IQ and learning approaches: Predicting academic performance*. Lund: Media Tryck.
- Skehan, P. (1998). *A Cognitive Approach to Language Learning*. Oxford: Oxford University Press.
- Safranji, J. (2009). Students' communicative competence. *Zbornik Instituta za pedagoska istrazivanja*, 41(1), 180-194.
- Šimonji-Černak, R. (2005). Neke determinante skolskog uspeha kod učenika pripadnika jezičkih manjina u Vojvodini nakon promene nastavnog jezika, magistarski rad. Novi Sad: Filozofski fakultet.
- Tanilon, J., Vedder, P., Segers, M. & Tillema, H. (2011). Incremental validity of a performance-based test over and above conventional academic predictors. *Learning and Individual Differences*, 21, 223-226.
- Tedik, S.V., Jorgensen, K. & Geffert, T. (2001). *Content-based Language Instruction: The Foundation of Language Immersion Education*. The Bridge: Research to Practice. ACIE Newsletter.
- Trumbull, E. & Pacheko, M. (2005). *Leading with Diversity Cultural Competencies for Teacher Preparation and Professional Development*. USA: Institute of Education Sciences.
- Teun A. van Dijk (1977). *Text and Context: Explorations in the Semantics and Pragmatics of Discourse*. London: Longman.
- Vigotski, L. (1983). *Misljenje i govor*, Nolit: Beograd.

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