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DEAF MIDDLE SCHOOL STUDENTS' COMPREHENSION OF RELATIONAL LANGUAGE IN ARITHMETIC COMPARE PROBLEMS

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Original scientific paper

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ABSTRACT

This study examined the performance of deaf and hard of hearing middle school students on arithmetic compare word problems with relational statements. Thirteen prelingual, severe-to-profound deaf students were selected to participate. The results showed that the students were more likely to misunderstand a relational statement and make a reversal error when the required arithmetic operation was inconsistent with the statement's relational term (e.g., choosing the operation of addition when the relational term was less than). There were no statistical differences in the number of reversal errors and on lexical markedness (i.e., marked vs. unmarked items). Finally, fraction-of-a-number relational terms exerted more influence on students' abilities to solve word problems than did the lexical markedness. Findings are interpreted in light of the consistency effect hypothesis. Directions for future research and implications for instruction are also provided.

Keywords: compare word problems, consistency effect hypothesis, deaf, mathematics

DEAF MIDDLE SCHOOL STUDENTS' COMPREHENSION OF RELATIONAL LANGUAGE IN ARITHMETIC COMPARE PROBLEMS

Middle school (e.g., grades 6 to 8 or 9 in the United States) constitutes a critical juncture when students hone their computational and procedural problem-solving skills, learn advanced inferential reading skills, and master arithmetic operations on whole numbers and fractions, thus laying the foundations

for high school algebra and higher-level mathematical abilities (Carpenter, Fennema, Franke, Levi, & Empson, 2015). During this important timespan of middle school, students need ample practice applying arithmetic operations (i.e., addition, subtraction, multiplication, and division) and solving word problems with whole numbers and fractions so they can use this knowledge base for the comprehension and solution phases of more complex word problems with relational language in high school and postsecondary education (Lewis & Mayer, 1987).

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One type of word problem with relational language, the *compare* word problem, particularly challenging for deaf and hard of hearing (DHH) students often leading them to an incorrect solution because of experiential, language, and reading gaps, particularly those related to the use of inference skills (Pagliaro, 2010; 2015). Even typical hearing children find solving the *compare* word problem to be cognitively demanding (Carpenter et al., 2015; Lewis & Mayer, 1987). As such, *compare* word problems require the problem-solver to read the word problem and contrast differences of unknown quantities while comprehending more complex sentence structures with relational terms. Other word problems such as the *combine* (unknown quantities increase) and *change* word problems (unknown quantities decrease) are relatively easier to solve as the relational terminology provides a consistent clue (*more* means addition; *less* means subtraction, etc.) rather than obstructs understanding as seen with word problems with inconsistent language (*more than* means subtraction, *less than* means addition) (Carpenter et al., 2015). Relational terminology not only requires linguistic understanding of the problem-solver to “read between the lines” or infer the meaning of the story posed in the problem, but also the student needs to have the mathematical knowledge to construct a mental model of what is being asked in order to figure out and infer values to either increase or decrease between two or more unknown quantities. Relational terms such as *more*, *less*, *n times as many*, including fraction-of-a-number terms *1/n as many*, add complexity to solving word problems (Pape, 2003).

The complexity of solving word problems has not gone unnoticed by professional societies. The Common Core State Standards (CCSS) [in the United States] curriculum addressed this issue. “Students need to make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt” (CCSS, 2013, p. 6). DHH students have difficulties with solving word problems as shown by their low performance on mathematic achievement tests. Specifically, Traxler (2000) found that 80% of American DHH students in grades four and eight performed at the ‘basic’ or ‘below basic’ level in both procedural performance and word problem solving. Furthermore, Traxler found that half of the fourth graders fell below a third grade level in procedures and at a second grade level in problem solving with the eighth graders scoring at

a fourth grade level in both areas (Traxler, 2000 cited in Pagliaro, 2010, p. 157).

To address this challenge, the purpose of the present study was to examine the performance of American DHH middle school students on arithmetic *compare* word problems with relational statements, including those with fractions. Fractions were included as studies have shown that DHH students lack basic understanding of fractions, specifically with calculations and understanding of order and equivalence (Titus, 1995), with concepts related to *part-to-whole* (Kelly & Mousley, 2001; Markey, Power, & Booker, 2003), with placement in order from smallest to the largest (Mousley & Kurz, 2015), with comprehending the relationship between fractions and ratios (1:3 and 1:4) (Nunes & Moreno, 2002) as well as with understanding of fractions when they are embedded in *compare* word problems (Lee, 2010). The next section reviews previous studies related to math abilities and word problems for DHH and typical hearing students.

LITERATURE REVIEW

DHH Students and Math Word Problems

Relational language. Understanding the difficulty DHH students have in solving word problems is multifaceted. For example, they often have few experiences with solving story problems with relational language such as the use of comparatives in phrases such as *more than*, *less than*, *faster than three times as many as*, *half the number* (Serrano Pau, 1995; Zenvenbergen, Hyde, & Power, 2001). Some studies demonstrated that these deficits begin early (Pagliaro, 2015; Pagliaro & Kritzer, 2013).

Emergent math literacy. Multiple studies have shown that DHH students experience a “math knowledge gap” compared to typically-performing hearing students (Pagliaro, 2015; Qi & Mitchell, 2012; Traxler, 2000) which can be traced back as early as the emergent math skills stage in preschool and kindergarten. Further, DHH students lack the tools to solve arithmetic word problems due to their infrequent informal math experiences or math readiness in the home with counting and measuring skills, their inability to understand non-linguistic number representations, and their low performance in computing basic arithmetic operations (Ansell & Pagliaro, 2006; Kritzer, 2009; Pagliaro & Kritzer, 2013; Zarfaty, Nunes, & Bryant, 2004).

Teacher and peer conversations about math concepts. Researchers reveal that teacher and peer conversations about arithmetic concepts are sorely needed as shown in an ethnographic study of three first-grade deaf education classrooms in Colombia, South America. Based on observations of teacher-student interactions while teaching mathematics, Corredor and Calderon (2010) gathered data on the math learning communication skills, social language in math concept development, and the importance of sign bilingualism (Colombia Sign Language or LSC and Spanish). The researchers noted that first grade students did not understand even basic aspects of counting such as one-to-one correspondence or ordinal, and cardinal numbers. Furthermore, the researchers observed that students had few opportunities for math exploration because they had no tools such as computers, calculators, and other math support devices. Researchers also discovered that the math teachers and even the deaf tutors and educational interpreters had limited mathematical professional training. Many of the teachers could not communicate with the children, and did not know sign language. Even when they had a deaf tutor or educational interpreter, this was still not enough because it did not provide children with in-depth interactive conversations about mathematical processes and reasoning (Corredor & Calderon, 2010).

Early elementary levels. Without these deep and extended conversations about math concepts, the "math gap" continues to widen as DHH students progress through the early elementary grades (Zarfaty, Nunes, & Bryant, 2004), with gaps in math understanding even following them into middle school (Lee, 2010). Notwithstanding that DHH students have visual strengths to assist them with counting and memory (Zarfaty et al., 2004), these skills do not always transfer to solving word problems in elementary school (Ansell & Pagliaro, 2006). To illustrate, Zarfaty and colleagues compared DHH and hearing children ($n = 10$, DHH; $n = 10$, hearing) who were between 31 and 54 months old on their ability to count and to remember a series of objects. Comparing presentations in a spatial array with a temporal array, the researchers found that young DHH students outperformed their hearing age-mates on the spatial array and performed as just as well on the temporal array. The researchers hypothesized that spatial strength may be a promising instructional strategy for teaching DHH preschoolers logic and counting as well as to develop informal problem-solving

strategies. However, in a follow-up study, Ansell and Pagliaro (2006) found that young DHH children in K-3 grades did not carry over these visual-spatial strengths in solving story problems. Instead the children focused on the numbers, ignoring what the story was asking of them. In this experiment, 59 DHH children in K-3 grades from nine schools for deaf students were administered several instruments to assess story problem solving strategies. The DHH students were given six story problems to solve that had been translated into American Sign Language (ASL). Younger students were more likely to use counting strategies rather than focus on the meaningful language in the story problems even when presented the story problems in their dominant language, ASL. Thus, researchers concluded that while translating the story problems into ASL does break down the English language barrier, the teachers could not depend on translation alone to ensure the young students understand the underlying arithmetic concepts and relations to arrive at the correct solution.

Math concepts. Underlying the understanding of word problems is comprehending mathematical concepts. Kritzer (2009) highlighted the importance of math concepts in her investigation of DHH preschool and kindergarten students' early informal/formal mathematical knowledge. *Utilizing the Test of Early Mathematics Ability (TEMA-3)*, she tested 29 children ages 4 to 6 years of age from seven schools for deaf children. Kritzer found that 60 % of her sample were experiencing delays with math concepts related to story problems, counting, number comparisons, the reading/writing of two to three digit numbers, and addition and subtraction facts (Kritzer, 2009).

Compare word problems. Compare word problems are even more challenging for young DHH students (Ansell & Pagliaro, 2006; Pagliaro & Ansell, 2012; Serrano Pau, 1995; Zevebergen, Hyde, & Power, 2001). In an early study with 12 young elementary DHH students in Spain, Serrano Pau (1995) examined comprehension across three types of arithmetic word problems—*change*, *combine*, and *compare* problems. With *change* problems an unknown quantity is decreased and with *combine* word problems the unknown quantities increase. See Table 1 for the three types, definitions, and examples of combine, change, and compare story problems and Table 2 for the four types of compare word problems with consistent/inconsistent language and unmarked and marked lexical markedness.

Table 1. Types, Definitions, and Examples of Word Problems (adapted from Carpenter et al., 2015; Hyde, Zevenbergen, & Power, 2003; Riley et al., 1984).

	Types	Definition	Example
1	Change (separate) (Unknown small quantity)	Questions that involve a process whereby there is an event that alters the value of the quantity.	Peter had three oranges. Michele gave him 2 more oranges. How many oranges does Peter have now?
2	Combine (Join) (Unknown big quantity)	Questions that relate to static situations in which there are two amounts. These are considered either as separate entities or in relation to each other.	Sarah has 4 oranges; Michele has 2 oranges. How many oranges do they have together?
3	Compare (Difference unknown)	Questions that involve the comparison of two amounts or quantities and the difference between them.	Ben has 5 oranges. Alice has 2 more oranges than Ben. How many more oranges does Alice have than Ben?

Table 2. Four Types of Arithmetic Word Problems with Consistent Language and Inconsistent Language and with Unmarked and Marked Lexical Forms (adapted from Hegarty, Mayer & Green, 1992)

Relational Term	Consistent Language	Inconsistent Language
Unmarked “more”	At Kroger water sells for \$1.11 per gallon.	At Kroger water sells for \$1.11 per gallon.
	Water at HEB is 4 cents more per gallon than at Kroger.	This is 4 cents more per gallon than water at HEB.
	If you want to buy 5 gallons of water, how much will you pay at HEB?	If you want to buy 5 gallons of water, how much will you pay at HEB?
Marked “less”	At Kroger water sells for \$1.11 per gallon.	At Kroger water sells for \$1.11 per gallon.
	Water at HEB is 4 cents less a gallon than water at Kroger.	This is 4 cents less per gallon than water at HEB.
	If you want to buy 5 gallons of water, how much will you pay at HEB?	If you want to buy 5 gallons of water, how much will you pay at HEB?

Serrano Pau found that DHH students in elementary school were better able to solve a word problem if the relational term (e.g., more than, less than) was consistent or the same as the operation required to solve the problem. To illustrate this concept, consider this 3-sentence two-step math word problem with consistent language. For clarification, a one-step word problem requires the student to have only one step to solve a word problem with one equation whereas a two-step word problem requires the student to solve two different equations before coming to the answer

with two different operations such as multiplication and addition, or two of the same operation such as using subtraction twice (<https://study.com/academy/lesson/two-step-math-word-problems.html>) In the Serrano Pau study, students responded by simply ignoring the comparative linguistic terms or they would simplify the comparative form of “*have more than*” to “*have*”, and this resulted in an misinterpretation of the task. Young DHH students were given 8 word problems individually which they read and solved on paper.

Overall, the results showed that children's higher reading comprehension abilities, tested on a standardized measure, resulted in better problem-solving abilities, but they still experienced difficulty with comprehending relational language, particularly if the language was *inconsistent* with the operation and the relational term.

In another study, Zevenbergen and his colleagues (Zevenbergen et al., 2001; Hyde, Zevenbergen & Power, 2003) tested 78 deaf Australian students who were moderately to profoundly deaf and who were enrolled in grades 1 to 12. Students were given a set of 24 word problems to solve across three word problem types: *change*, *combine*, and *compare* (Please refer again to Table 1). Targeted students from each age group were interviewed using the "think-aloud" procedure. The "think-aloud" is a research methodology that uses verbal reports as data in which the experimenter asks a student to report about how he or she is comprehending. In the Zevenbergen et al.'s study, transcribed strategies "indicated a restricted understanding of the intricacies of mathematical language" and "an overreliance on trigger words" (p. 213). Trigger words are keywords in a word problem that triggers the student to focus on an operation (e.g., *more* triggers addition; *less* triggers subtraction). Furthermore, researchers found that deaf students had greater difficulty in solving word problems with the relational term, *less* than. Students misunderstood the term *less* as *take away* to always mean subtraction and to look for numbers lesser in value in the problem. Similarly, students overgeneralized the term *more* to mean addition. The term, *than*, was often overlooked or ignored by the students leading to misinterpretation of the word problems similar to Serrano Pau's (1995) finding with elementary DHH students. Furthermore, the researchers found DHH students had more difficulty with *compare* word problems that required a comparison and a difference (Please see Table 1 again). These results showed that students had better performance on *change* problems than on the *combine* and the *compare* problems particularly among the younger DHH students who had less experience with English and mathematics. The researchers found that comparative linguistic expressions were difficult for all reading and math levels of students.

More recently, researchers have investigated DHH students' comprehension of compare word prob-

lems when they are translated into ASL (Ansell & Pagliaro, 2006; Pagliaro & Ansell, 2012). These researchers tested 59 DHH children in K-3 settings from ages 5 to 9 years of age who attended schools for deaf students in the United States. Six story problems were translated into ASL. The story problems represented the operations of addition and subtraction. The results on the compare word problem (difference unknown) showed significantly less strategy usage by the children. The word problems that required combining or joining or separating elements were easier than the compare word problems with a difference being unknown. The majority of the students over-relied on a "counting strategy." When using the counting strategy, the students would take one of the quantities (a number) in the problem and continue counting a sequence from the first number to the other quantity (number), then use "trigger" or "key" words such as *more* and use the operation of addition or see the word *less* and use subtraction (Ansell & Pagliaro, 2006; Pagliaro & Ansell, 2012).

Mathematics language. The difficulty found with mathematics vocabulary that is embedded in relational language statements has been found to be challenging for even high math functioning DHH high school students (Kidd, Madsen, & Lamb, 1993). These researchers used the terminology *words with special emphasis in mathematics* to signify a particular type of vocabulary that is problematic for DHH students. For example, Kidd and her colleagues identified phrases such as *how many*, *how many more*, *how many less* and defined them as vocabulary that had subtle meanings in word problems that were different in meanings than these same words in everyday usage.

In this study, researchers tested 25 DHH students in grades 9 to 12 who were academically in the top two ability groupings and used ASL and Signed English as their preferred mode of communication. A 50-item multiple-choice test was constructed and the content consisted of five categories of mathematics vocabulary found in word problems in middle school textbooks. The vocabulary that was selected consisted of words with more than one meaning (e.g. square), technical vocabulary (e.g., sine, polynomial), varied forms (e.g., multiply, multiplicand, multiplication), abbreviations and symbols, and words with special emphasis in mathematics.

The researchers noted "The scores decline in the section on words with special math emphasis in mathematics" (p. 420). They further commented that these words are seen in everyday life; as multiple meaning words, they take on a different meaning when embedded in math word problems, hence they create comprehension difficulty related to mathematics learning (Kidd et al., 1993).

English grammar challenges. Deafness can obstruct the learning of spoken and written English (Paul, 2009), and this carries over into math word problems in the areas of both vocabulary and syntax. To illustrate syntax difficulties, consider this word problem provided by Zevenbergen et al. (2001, p. 216): *John has 2 buckets. Eric has 6 buckets. How many more buckets than John does Eric have?* The final sentence requires a comparison to be made and a difference calculated. Even to the native English user, this word problem requires careful reading of each individual sentence, making note of what is being asked, visualizing a mathematical representation, and choosing the correct operations in order to arrive at a correct solution. Zevenbergen and his colleagues found that DHH students "jumped to a fast solution" by zeroing in on the word, *more* and interpreting it to mean-- simply adding the 2 numbers (6 and 2) to arrive at the incorrect solution of "8." The researchers found other students simply overlook and ignore the term *than* and answer "6." Both strategies led to incorrect solutions. Zevenbergen and his colleagues concluded that DHH students had difficulty with word problems due to both the syntax of the question and choosing the correct arithmetic operations.

Even when vocabulary and syntax were eliminated and substituted with animated computer games, as Frostag and Ahlberg (1999) attempted in their study, DHH students still had conceptual difficulties with understanding word problems. The experimenters followed up with a paper task where the DHH students retold the subtraction word story problem then chose the correct answer using a picture/number format. Thirty two Norwegian DHH children with varying hearing levels from less than severe to profound in K-4 grade were selected. All used Norwegian Sign Language (NSL) and had basic counting skills. After being administered a set of *change* word problems, the students were interviewed about their strategies. After the rate of correct solutions were computed

and strategies categorized, the results showed that DHH students did not know how to approach word problems thoughtfully. Norwegian DHH students simply focused on the numbers in which they combined or subtracted them without any logical reasoning, a finding similar to those of Ansell and Pagliaro (2006) and Zevenbergen et al. (2001) who also found DHH students were focused on numbers and not on mathematically, logically-driven solutions.

Other grammar obstacles. Relational terms and pronominal references were found to be additional grammatical obstacles for DHH students in high school in England. Swanwick, Oddy and Roper (2005) studied the scores and error patterns of 126 DHH students who were 14 years old and who were administered *the National Curriculum Test in Mathematics*. They found that DHH students had difficulty with phrases such as more than and less than and also had difficulty with comprehending the linguistic structure of referential pronouns on math word problems. The researchers noted, "... one literacy problem experienced by deaf pupils is that of following the connected meaning of a written passage, as they often find it difficult to make sense of pronouns (*its, that, he, the*) when they are disconnected from the object or person to which they refer to" (p. 11). Swanwick and her colleagues (2005) attributed this difficulty to the effects of deafness on auditory short-memory and its role in processing written language.

Postsecondary DHH students. Studies have shown that the ability to solve word problems does not increase as students progress into postsecondary school. Similar to young DHH students, university students also exhibited difficulty with finding solutions to word problems because of reading comprehension level, computation errors, procedural errors, or even motivational factors. Sometimes they would simply leave the word problem blank and not attempt any solution at all. One might assume that as DHH students become older, had more language and more math computational and problem solving experiences, they would be able to self-monitor their progress. However, researchers found the reverse to be true. Findings showed that DHH students neither had the computational skills, problems solving skills, nor knew how to self-correct while finding solutions to word problems (Kelly, Lang, Mousley, & Davis, 2003; Kelly & Mousley, 2001).

While controlling for language, reading, and computational skills, Kelly and Mousley (2001) found that DHH students made numerous errors with the word problem format, and these errors included leaving the problem blank, making computational errors, and making procedure errors. These researchers tested 44 DHH college students who were grouped according to reading level (low, middle, high) after taking the *California Achievement Test for Reading Comprehension*. DHH students were given 30 mathematical word problems presented under the number/picture only condition ($n = 15$) and word only condition ($n = 15$). DHH students were able to solve the computations in word problems presented in the visual format (pictures and numbers), but were not able to solve the word problems when language was added.

In another study with DHH postsecondary students, Kelly et al., (2003) examined a more complex aspect of word problems, that of relational language with *consistent* language and with *inconsistent* language. In this study, 80 university level DHH students were tested on reading comprehension using the *California Achievement Test for Reading Comprehension*. Based on their performance, the students were divided into four groups from low to high ability readers. Using materials developed by Lewis and Mayer (1987), students were given 8 target arithmetic *compare* word problems with filler problems for a total of 32 word problems. Filler problems are ones that do not follow the same format as the word problems being tested. The average grade level readability of the text per problem was 3.6 and ranged from 3.2 to 5.4 for the 32 problems.

The DHH students, regardless of reading ability, correctly solved more consistent word problems than inconsistent word problems, thus supporting Lewis and Mayer's (1987) consistency effect model. The researchers extended this model by finding that the reading ability levels of the DHH students did not influence performance on word problems with inconsistent language. The results showed that all students produced a higher percentage of reversal errors on inconsistent language problems than on consistent language problems, regardless of their reading level. That is, the consistency effect was not affected by reading level, although the researchers reported that fewer reversal errors were produced by the high reading group on both sets of problems.

Teacher-preparation practices. Teachers can play a critical role in mathematics instruction if they are adequately trained, provide cognitively demanding math instruction, and have high expectations (Pagliaro,

2015). Kelly, Lang, and Pagliaro (2003) sent out a survey to 133 teachers in grades 6 through 12 where 50 percent worked at center schools and 50 percent in mainstream programs. They found that teachers typically did not provide DHH students with cognitively challenging mathematical situations to solve in a word problem format. Many survey respondents did not have university math preparation coursework. Moreover, teachers had low expectations due to DHH students' underdeveloped language proficiencies. Teachers were neither academically prepared nor equipped to teach DHH students how to develop concepts about mathematical representations, but instead focused on practice exercises rather than true problem solving strategies. While teachers focused frequently on visualization strategies to capitalize on DHH students' visual strengths (see Kritzer, 2006, for similar results), they did not adequately teach students how to mentally represent mathematical relationships necessary to becoming a successful problem solver. Teachers also lack university preparation in mathematics with few having mathematics teaching certification. Those teachers who were certified, however, were found to use more challenging, analytical strategies for word problem solving.

Typical Hearing Students and Math Word Problems

Compare word problems. Similar to DHH children, those with typical hearing levels, as early as the first grade, may be able to solve problems in numeric formats. However, when problems are presented in a word format, they have difficulty solving them (Cummins, Kintch, Reusser, & Weimer, 1988). Furthermore, first graders have an easier time solving *combine* and *change* word problems, than solving *compare* word problems where they have to understand not only the unknown quantity, but also the relationship between the numbers in the word problem. With older students in elementary and middle school, Carpenter, Corbitt, Kepner, Liguist, and Reys (1980) found that, among 9 to 13 year old children in the United States, most did well on numeric format calculations, but 10 to 30 percent did worse when solving *compare* arithmetic word problems.

Consistency Effect Hypothesis. Lewis and Mayer (1987) devised their consistency effect hypothesis and have utilized this abstract representation to explain how students solve compare word problems with populations ranging from elementary to postsecondary levels.

According to this model, students possess their own schema or preference concerning the form in the statements, then they rearrange the information but arrive at an incorrect answer by imposing their own order of information on the problem rather than comprehending what is actually being demanded of them. This theory explains why students have more difficulty with solving problems with relational statements that are inconsistent with the arithmetic operation. Furthermore, Lewis and Mayer posited that both the *inconsistent* and *consistent* language problems produce different error rates.

Hearing college students. Lewis and Mayer (1987) studied 96 hearing college students who were assessed across 8 word problem types. These researchers described the difference between consistent and inconsistent language problem types. They identified three error categories: reversal errors (RE), arithmetic errors (AEs), and goal monitoring errors (GMEs). The researchers reported that students solved word problems with a preconceived expectation on how the statements should be ordered, and this partly explained their reversal errors in the compare word problems with inconsistent language. They also reported that hearing college students are more likely to miscomprehend a relational statement in an inconsistent word problem and made a reversal error (incorrect arithmetic operation) when the relational term was marked (e.g., *less than*).

Lewis and Mayer (1987) emphasized the salience of the terms “less” and “more” or “1/n as many” in inconsistent multiplication problems as the cause for the greater number of errors in solving word problems. Students were found to be more likely to misunderstand a relational statement in a word problem with *inconsistent* statements and make reversal errors depending on the lexical marker of the statement (Lewis & Mayer, 1987). Herbert Clark, a psycholinguist argued that *unmarked* positive adjectives (e.g., *more*) are stored in the memory in a less complex form than those of their negatively *marked* (e.g., *less*) opposites (cited in Kelly et al., 2002). In other words, *unmarked* positive terms like the word *more* are easier to process and comprehend than *marked* negative words like *less*. Students who are solving word problems with a marked negative term in the inconsistent relational statement (e.g., *less* in addition problems or *1/n as many* in multiplication problems) will produce more reversal errors. On the other hand, Kelly explained that students can more easily process a *compare* word problem with an *inconsistent* relational statement with an unmarked term (e.g., *more* in

subtraction problems and *n times as many* in division problems) resulting in fewer reversal errors.

Lewis and Mayer (1987) also suggested that the larger number of errors on inconsistent multiplication problems may be from the complexity of the underlying mathematical concept contained in word problems with fraction-of-a-number terms, and this may impede students' comprehension more often than the lexical markedness of the term. With inconsistent language word problems, students tend to make reversal errors by failing to choose the correct arithmetic operation for the correct solution.

Other researchers have extended the findings of Lewis and Mayer's model (1987) by developing experiments utilizing hearing students at various ages (college, junior high, elementary) with different methodologies such as eye-tracking, think-a-loud, or verbal reports, and retellings. As such, Verschaffel, De Corte, and Pauwells (1992) conducted three eye-movement experiments where they collected performance data, response times, and eye movements of participants while reading and solving word problems. In the first experiment, 19 hearing college students solved 30 one-step addition and subtraction *compare* word problems, which included 8 consistent and 8 inconsistent language forms. This experiment did not support the Lewis and Mayer's model, and the eye-fixation data revealed that students did not need more time with the word problems with inconsistent language. Data in the second experiment with 15 students in the third grade students who were administered 26 one-step addition and subtraction problems did support the model.

In the third experiment, 20 college students were given 24 two-step *compare* problems, half contained the *consistent* language form and half the *inconsistent* language form. Students produced more reversal errors solving the *inconsistent* language problems than with *consistent* language problems. The researchers concluded that the Lewis and Mayer's model is supported only with word problems with *inconsistent* language that put heavy cognitive and linguistic demands on the participants.

In another study, Hegarty, Mayer, and Monk (1995) also used eye-fixation data and memory data to examine performances. Success was defined as arriving at the correct answer. Thirty-eight college students participated and took a test of 48 *compare* arithmetic word problems with consistent and inconsistent language forms. Unsuccessful word problem solvers needed more time and utilized the “direct translation” (also called key-word) approach.

Hegarty has defined the “direct translation” or “short-cut” approach; this means that the problem solver tries to select the numbers in the problem and key relational terms, then develops a solution that involves combining the numbers and applying the arithmetic operation that is primed by key words (e.g., *addition* if keyword is “more” and *subtraction* if it is “less”). In contrast to this surface structure strategy is the “meaningful approach” where the successful problem-solver translates the problem statement into a meaningful mental model of the events presented in the problem.

In still another study, Hegarty, Mayer, and Green (1992) examined 32 college students' eye-fixations as they read arithmetic word problems with consistent and inconsistent language forms on a computer monitor and verbally stated a solution plan for each problem. Least skilled math students made more reversal errors on inconsistent and consistent problems. Here students needed more time for word problems that had inconsistent language. More skilled problem solvers fixated longer or needed more time in the problem model and solution plan rather than during the reading stage. More skilled math students also needed more time to re-read previously fixated words for inconsistent than for consistent problems. When using the superficial strategy of the direct translation approach, students were not able to visualize a situational model for the problem. The researchers found that the most successful word problems solvers, that is, those who arrived at the correct answers, focused on variable names and relational terms so they could formulate a meaningful mental model of the problem. Pape (1998, 2003) studied 106 students in sixth to ninth grade who read, solved, and recalled one- and two-step addition, subtraction, multiplication, and division compare word problems. Using think-aloud protocols and recall data, Pape provided strong support for the consistency effect hypothesis. In other words, the data showed that problem solvers are likely to translate inconsistent language problems to problems that better match their schema. Students made more reversal errors (used an opposite operation) on inconsistent language than consistent language problems, recalled inconsistent language as consistent language, and inverted the relational sentence during recall more often following a reversal error. Differences were not found for number of rereadings, or total response time,

and quality of recall. Most students used the “direct translation” approach without thinking through the solution. Students committed more errors overall and reversal errors specifically (using the opposite operation) on inconsistent language forms than on consistent language forms and recalled inconsistent language forms as consistent problems, making reversal errors.

Pape also found that junior high students had difficulty forming representations and solving problems involving fraction-of-a-number constructions. Fraction-of-a-number indicates the relationship between part and whole. Students are asked to think-aloud while reading, solving, and recalling one and two-step addition, subtraction, multiplication, and division compare word problem. Lewis and Mayer's (1987) consistency hypothesis was examined by comparing problem solving success, patterns of errors, problem-solving behaviors, number of rereadings, initial reading time, total response time, quality of problem recall, and recall reversals for consistent language and inconsistent language problems. The think-aloud stimulus of 16 mathematics word problems included 12 target word problems with two step and one step procedures for a total of 960 word problems. Most students used the direct translation (69%) than meaningful approach (31%). The largest number of errors were reversals and fraction-of-a-number errors with linguistic and computational errors found less frequently in this sample.

Utilizing a younger sample, Verschaffell (1994) tested the consistency effect hypothesis with 40 fifth-graders who were 10 to 11 years old and who were asked to solve and retell a set of one-step compare problems. The retelling technique of a word problem is not just memorizing and reproducing, but requires the student to construct or rebuild the problem from the mental representation that she has generated after reading the problem and before choosing the arithmetic operation. Students were given nine one-step addition and subtraction word problems, one warm up problem, and four compare problems (two with consistent language structure; two with inconsistent language structure). Students solving consistent language problems chose more correct arithmetic operations, were faster in solving the problems, and had more correct retelling protocols, compared to their performance on inconsistent language problems.

RATIONALE FOR THE PRESENT STUDY

While other studies with hearing and DHH students as reported above examined compare problem solving, relational language, and fraction-of-a-number terminology, none focused specifically on DHH students in junior high who used a signed language as their primary language. The present study also provides a test of the consistency effect hypothesis for DHH students in junior high school (grades 7 to 9).

HYPOTHESES

Three hypotheses were tested.

- H₁: Compare word problems that have relational statements consistent with the arithmetic operation will result in more correct answers than word problems having relational statements that are inconsistent with the arithmetic operation.
- H₂: With compare word problems, those having negative marked terms and positive marked terms will be equally difficult, and there will be no difference in students' performance on producing reversal errors.
- H₃: More errors will occur with word problems containing fraction-of-a-number relational terms than on problems without such relational terms.

METHODOLOGY

Participants

Sampling procedure. A purposive sampling procedure was utilized. By definition, "The purposive sampling technique, also called judgment sampling, is the deliberate choice of a participant due to the qualities the participant possesses" (Etikan, Musa, & Alkassim, 2016, p. 2). Purposive sampling is useful when randomization is not possible. Since deafness is considered to be a low-incidence disability,

large groups of DHH students in junior high are difficult to locate in one central setting except for state schools for deaf students. To this end, students were selected from a residential school which centralizes a larger number of deaf students. Financial resources were not available to test deaf students at multiple sites with smaller numbers of DHH student enrolled in mainstream programs. Thus, the researchers purposively located a suitable group of middle school deaf students in one residential school.

Background survey. The survey was designed to examine students' characteristics including age, grade, communication mode, pure-tone averages (PTAs), and standardized test scores in English reading and mathematics. The PTAs, reading, and mathematics scores were obtained from the students' records in the school administration office after University's Institutional Review Board (IRB) approval.

A total of 16 deaf students located in a school in the middle-eastern region of the United States were initially recruited. Students were selected based on the following criteria: hearing loss in the severe to profound range, as this is the range that is most vulnerable to access and acquisition of spoken and written English (Paul, 2009). Students were in junior high school or seventh to ninth grade and were between the ages of 10 and 16 years, inclusive. Deafness occurred prior to language being developed (i.e., prior to age 3). No additional educational or learning disabilities were present, and the students must be willing to participate.

Of the 16 students, three students were excluded for data analysis due to incomplete responses, leaving 13 students. Participants ranged in age from 10.2 to 16.6 years, with a mean age of 13.51 years, and spanned grade levels seven through nine. One student from the 4th grade was included because her teacher believed that she would be able to solve word problems. The reading levels of participants ranged from 2.5 to 8.5 grade with a mean of 5.33; math level ranged from 4.10 to 8.40 grade with a mean of 5.97. See Table 3.

Table 3. Characteristics and Language Backgrounds of Participants

#	Grade	Age	PTA	Communication/language use at home	Math	Reading
1	7 th	13.6	L:120 R:120	Signed English	8.4	5.5
2	7 th	14.8	L:87 R:87	Few signs	7.2	4.0
3	7 th	14.3	L:105 R:107	Signed English	4.2	3.0
4	7 th	13.8	L:103 R:70	Spoken	4.1	2.5
5	7 th	14.6	L:107 R:107	ASL	7.5	5.0
6	8 th	13.7	L:108 R:88	Signed English/Spoken	5.9	5.5
7	4 th	10.2	L:108 R:120	Signed English/Spoken	5.1	4.5
8	9 th	15.10	L:82 R:83	Few signs/writing	7.1	8.5
9	9 th	16.4	L:120 R:102	Few signs	5.7	7
10	9 th	15.11	L:93 R:102	Few signs	6.7	5
11	9 th	15.6	L:93 R:92	Signed English	5.9	8
12	9 th	16.6	L:105 R:103	ASL	5.7	8.5
13	9 th	16.6	L:103 R:77	Signed English	8.4	7

Note: PTA = pure tone average
 L = left ear
 R = right ear
 ASL = American Sign Language

Materials

Math word problems. A set of *compare* word problems drawn from Pape's study (1998) with hearing middle school students in the 5th and 6th grade were utilized in the present study. The new Dale-Chall readability formula (Chall & Dale, 1995 as cited in Kelly et al., 2003) indicated that the readability levels of the word problems utilized in the present study was between 4th grade and 5th grade. There were 16 word problems, including 12 target problems and 4 filler problems. The four filler word problems also have the same word problem structure, but were not *compare* word problems with relational terms. The filler problems were used to minimize any stereotyped responses and to provide variation in the types of problems students were solving (Pape, 1998). Filler problems were excluded from the data analysis.

The twelve target word problems were composed of six consistent and six inconsistent language problems. Eight of them were two-step consistent language and inconsistent language problems that required four arithmetic operations (i.e., addition, subtraction, multiplication, and division). The remaining four problems were two one-step consistent language and inconsistent language problems that required multiplication and division operations only (Pape, 1998). Additionally, these problems contained a fraction number of relational term that required fractional knowledge to solve the problems. According to the teachers of the participants in the present study, these problems were representative of the types of mathematics problems in the textbooks at the middle-school grade level. The adaptation of the original tasks (Pape, 1998) involved only a change in the names of stores to minimize the effects on problem-solving performance. For example, *Arco* or *Pathmark* stores were replaced with *BP* or *Kroger*, which were familiar to the students. See Table 4.

Table 4. Types of Problems and Solution Steps for Consistent Language and Inconsistent Language Word Problems (adapted from Pape, 1998; 2003)

Problem statement	Number of solution steps	Types of problems	Necessary Operation	Relational term
1. At BP, gas sells for \$1.13 per gallon. Gas at Speedway is 5 cents more per gallon than gas at BP. How much does 5 gallons of gas cost at Speedway?	2-step	Consistent	Addition	5 cents more
2. At Kroger, a pound of pears cost \$1.16. That is 15 cents less per pound than at Walmart. How much does 5 pounds of pears cost at Walmart?	2-step	Inconsistent	addition	15 cents less
3. At BP, gas sells for \$1.13 per gallon. Gas at Speedway is 5 cents less per gallon than gas at BP. How much does 5 gallons of gas cost at Speedway?	2-step	Consistent	Subtraction	5 cents less
4. At Meijers a pound of sugar costs 89 cents. That is 20 cents more per pound than at Walmart. How much do 5 pounds of sugar cost at Walmart?	2-step	Inconsistent	Subtraction	20 cents more
5. Mary runs about 6 miles per week. Sandy runs 3 times as many miles per week as Mary. How far does Sandy run in a week?	1-step	Consistent	Multiplication	3 times as many
6. The local farm sells about 15 watermelons each day during the summer. The supermarket sells 3 times as many as the farm stand a day. How many watermelons does the supermarket sell in 5 days?	2-step	Consistent	Multiplication	3 times as many
7. Joe runs 6 miles a week. He runs $\frac{1}{3}$ as many miles a week as Ken does. How many miles does Ken run in a week?	1-step	Inconsistent	Multiplication	$\frac{1}{3}$ as many
8. Sam's Grocery sells 180 eggs a day. That is $\frac{1}{3}$ as many eggs as Mike's Grocery sells a day. How many eggs does Mike's Grocery sells in 3 days?	2-step	Inconsistent	Multiplication	$\frac{1}{3}$ as many
9. Donatos sells 120 regular pizza pies a day. Pizza Hut sells $\frac{1}{3}$ as many regular pies as Donatos in a day. How many regular pizza pies does Pizza Hut sell in a day?	1-step	Consistent	Division	$\frac{1}{3}$ as many
10. Kroger sells 50 pounds of potatoes a day. Meijers sells $\frac{1}{5}$ as many potatoes as Kroger does in a day. How many pounds of potatoes does Kroger sell in 4 days?	2-step	Consistent	Division	$\frac{1}{5}$ as many
11. Last year the sixth grade sold 125 raffle tickets each day. That is 5 times as many tickets as the fifth grade sold per day. How many tickets did the fifth grade students sell in a day?	1-step	Inconsistent	Division	5 times as many
12. Kroger sells 120 bottles of water a day. That is 2 times as many bottles as Giant's sells in a day. How many bottles of water does Giant's sell in 5 days?	2-step	Inconsistent	Division	2 times as many

Procedures

Preparation. To gain trust, before conducting this study, the first researcher met with the students and asked them what language they prefer to use-ASL or Signed English. She also observed them in classes

several times and interacted with them after school using ASL. The participants and their math teacher, who was deaf, reported using a signed language (American Sign Language) as their primary or preferred language in school. Students were individually tested in a quiet room located in the library.

Each student was instructed to follow the directions that were signed and then the directions were presented in the written form to ensure that all students had access in both languages. All students were instructed to write down all of the calculations they used while solving each word problem so the researcher could see their work. They were also informed that the researcher could not answer any questions related to solutions while working on the word problems.

To ensure that students understood the directions, the researcher conducted a practice session with two word problems, which were not *compare* word problems. Additionally, if a student left blank a problem, then the researcher asked the student why she/he left the problem blank. If a student forgot to write the process of solving the problem, the researcher provided a reminder. After completing the practice session, a set of 16 word problems were given to each student. The entire session took approximately 20-30 minutes to complete.

Scoring. The participants' written responses on the 12 word problems were analyzed to determine the number of correct responses and the types of errors. Each solution was scored as correct if both the numerical answer and procedures were correct or was scored as incorrect if either the numerical answer or procedures were incorrect. If there were several instances of a type of error, only the first error of a type was recorded so that multiple errors of the same kind were counted only once (Kelly et al., 2003). Additionally, incorrect problems were further analyzed and categorized with respect to error types adapted from the work of Pape (2003) and Kelly et al. (2003). These error categories are related to the DHH students' learning about *compare* word problems in that they show the students' thinking and what barriers they face.

In the present study, the following seven types of errors were identified:

1. Linguistic error: Students were unable to understand and solve the problem, and their solution steps did not make sense or solution plans were incorrect although the students had the ability to compute arithmetic operations (e.g., addition, subtraction, multiplication, and division).
2. Reversal error: Students used the opposite arithmetic operations to solve the problems. That is, students subtracted when the correct operation was addition; they added when the correct operation

was subtraction; or they used multiplication instead of division or division instead of multiplication.

3. Computation error: Students produced computation errors in one- or two-step problems, or they did not copy a number correctly for the computation procedure.
4. Fraction error: Students were unable to compute the problem that required fraction arithmetic operations. For example, students were unable to compute the fraction.
5. Goal-monitoring error: Students omitted one of the two computational steps in the two-step solution problems.
6. Multiple errors: Students committed the following errors more than once.
 - solution steps were incorrect or omitted
 - solution plans were incorrect
 - computation errors occurred
 - solution steps did not make sense
7. Problem left Blank: Students indicated an inability to solve the problem after reading it.

Data Analytic Plan

A large randomized sample is always desirable to obtain powerful results. However, when only smaller size samples are available, a t-test can be used if the effect size is large (deWinter, 2013). In the present study, the paired t-test was used to examine the effect of the consistency effect hypothesis. The number of correct responses and types of errors were documented, using Pape's (2003) rubric. A series of pair t-tests were run, setting the alpha level at .05.

RESULTS

Word Problem Scores

Thirteen students worked on 12 word problems, including 6 consistent language problems and 6 inconsistent language problems, resulting in a total of 151 (13 participants x 12 word problems – 5 problems left blank) written responses. Overall, the results indicated that approximately 65% of consistent language problems were solved. Participants produced significantly more correct solutions on the consistent language problems than on inconsistent language problems (see Table 5). The effect size was .81 and is considered large Cohen (1988).

Table 5. The Frequency and Percentages of Problem-solving Success and Error Types for Consistent Language and Inconsistent Language Word Problems

Types of errors	6 Consistent Language Problems Frequency (percentage)	6 Inconsistent Language Problems Frequency (percentage)	Total Frequency (percentage)
Correct solutions	51* (65.38%)	8* (10.26%)	59 (37.82)
Linguistics error	8 (10.26)	9 (11.54)	17 (10.90)
Reversal error	3 (3.85)	46* (58.97)	49 (31.41)
Computation error	2 (2.56)	0 (0)	2 (1.28)
Fraction error	3 (3.85)	2 (2.56)	5 (3.21)
Goal monitoring error	5 (6.41)	2 (2.56)	7 (4.49)
Left problem blank	3 (3.85)	2 (2.56)	5 (3.21)
Multiple errors	3 (3.85)	9 (11.54)	12 (7.69)
Total	78 (100%)	78 (100%)	156 (100%)

*significant at the .05 level

Types of Errors

Approximately 65% of consistent language problems were solved correctly whereas only 10% of inconsistent language problems were correctly solved. To identify what kind of problems students most correctly solved, an individual item analysis was conducted. Multiplication and addition problems were the most correctly used operations on consistent language problems. Students solved only a few of the inconsistent language problems with the multiplication, subtraction, and division operations, and no student solved an inconsistent language problem that requires an addition operation. To solve the inconsistent language addition problems (e.g., At Kroger, water sells for \$1.11 per gallon. This is 4 cents less per gallon than water at HEB.) with the relational term “less”, the operation called for addition, not subtraction. Thus, to obtain the correct answer, students must use their inference skills and reorganize mentally the relational sentence to select the arithmetic operation needed for the correct answer.

The types of errors students committed while solving the word problems were also analyzed, based on Pape's (2003) rubric. A total of 92 errors made by the students

except for problem left blank ($n = 5$) were identified. The decision was made to label leaving a blank as an error after we instructed the students to finish all word problems. The most common types of errors were reversal errors for both problems ($n = 49$, 31.41 %), linguistic errors ($n = 17$, 10.90 %), and multiple errors ($n = 12$, 7.69%). In contrast, the fewest types of errors were goal monitoring errors ($n = 7$, 4.49 %), fraction error ($n = 5$, 3.21 %), and computation errors ($n = 2$, 1.28 %). In addition, the errors students committed were different according to the types of problems (i.e., consistent language compared to inconsistent language word problems). For example, linguistics ($n = 8$; 10.26%) and goal monitoring errors ($n = 5$; 6.41%) were greater for the consistent language problems. However, with inconsistent language problems, the majority of the errors were reversal errors ($n = 46$, 58.97%) and linguistics and multiple errors ($n = 9$; 11.54%), respectively (See Table 5). The reversal errors generated by students resulted from misunderstanding of the relational statements that are inconsistent with the required arithmetic operations or from the use of key words rather than attempts to understand what the problem was asking of them.

Lexically Marked vs. Unmarked Relational Terms

To examine the effect of lexical markedness on inconsistent language problems, the reversal errors in inconsistent language problems with positive unmarked relational terms (e.g., more, taller, as much) were compared to reversal errors in inconsistent language problems with negative marked relational terms (e.g.,

less, 1/n as much). There were no differences in the number of reversal errors between inconsistent language problems that required addition and multiplication operations (e.g., marked terms, 30.77%) and inconsistent language problems that required subtraction and division operations (e.g., unmarked terms, 33.33%). See Table 6.

Table 6. Percentages for Reversal Errors and Correct Responses Relative to the Lexical Marked Terms

	Marked Terms in IL Problems (<u>more difficult to comprehend</u>)			Unmarked Terms in IL Problems (<u>easier to comprehend</u>)		
	IL addition	IL multiplication	Total	IL subtraction	IL division	Total
Reversal Error (%)	12.82	17.95	30.77	8.97	24.36	33.33
Success rate M (SD)	0 (0)	.08 (.19)	.05 (.13)	.23(.44)	.08 (.19)	.13(.22)

Note: M = mean; SD = standard deviation
IL = inconsistent language

The success rate of problem solving between inconsistent language and marked language and inconsistent and unmarked language were compared to examine if the lexically marked terms affected performance on inconsistent language word problems. The results indicated that there was no statistically significant difference between both groups, although participants produced slightly more correct

solutions for inconsistent language problems when the relational terms were unmarked ($M = .13$, $SD = .22$) as compared to marked ($M = .05$, $SD = .13$) items, $t(12) = 1.39$, $p = .34$. Figures 1 and 2 present percentages for reversal errors and the success rates for lexically marked terms as compared to the lexically unmarked terms for the inconsistent language problems.

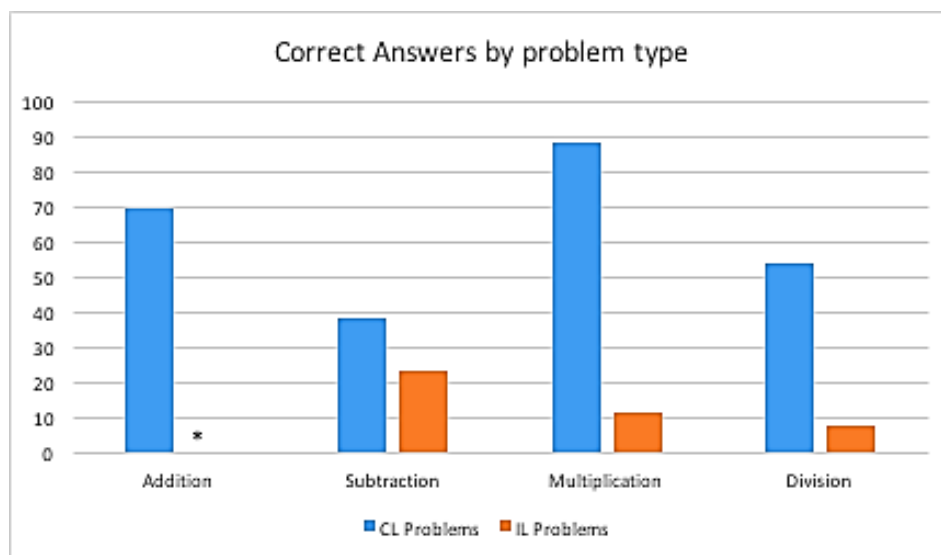


Figure 1 Correct Answers by Problem Type

Note: CL = consistent Language;
IL = inconsistent Language

*: zero score

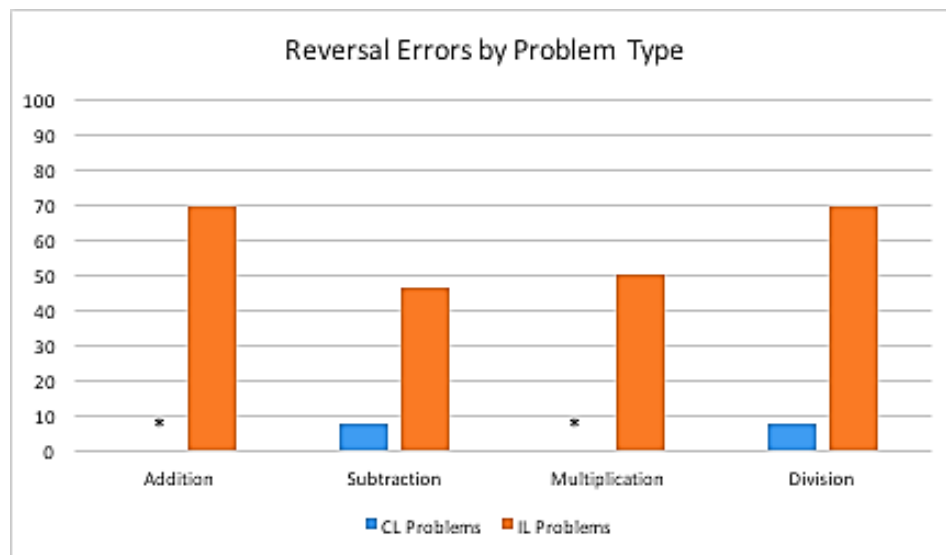


Figure 2 Reversal Errors by Problem Type

Note: CL = consistent Language
IL = inconsistent Language

*: zero score

Fraction-of-a-Number Relational Terms

Participants' performances on word problems with and without a fraction-of-a-number relational term were analyzed to examine if there were any differences between performance on word problems with such relational terms and without such relational terms. The findings indicated that participants solved consistent language multiplication and inconsistent language division problems without a fraction-of-a-number word-

ing ($M = 1.92$, $SD = .64$) significantly more correctly than consistent language division and inconsistent language multiplication problems *with* such wording ($M = 1.31$, $SD = .85$), $t(12) = -2.31$, $p < .05$. The findings demonstrate that a fraction-of-a number relational terms were more difficult and exerted more influence on students' problem-solving performance than did the lexically marked terms. The correct rates (percentages) of word problems with and without fraction-of-a-number relational terms are presented in Table 7.

Table 7. Percentages of Correct Responses for Fraction and Non-Fraction

	Fraction		Total	Non-Fraction		Total
	CL Division	IL Multiplication		CL Multiplication	IL Division	
Problem-Solving Success (%)	53.9	11.6	32.8	88.5	7.7	48.1

Note: CL = consistent language
IL = inconsistent language

DISCUSSION

DHH middle school students were administered a set of 12 *compare* word problems. Students correctly solved more *compare* word problems that have relational statements consistent with the arithmetic operations than word problems having relational statements that are inconsistent with the arithmetic operations. Therefore, these findings reveal that the consistency effect hypothesis is supported by the performance of DHH middle school students on *compare*

word problems. Further, these results supporting the consistency effect hypothesis are robust across previous studies with DHH college students (Kelly et al., 2003), hearing college students (Lewis & Mayer, 1987), hearing students in junior high (Pape, 2003), and hearing students in elementary grades (Verschaffel et al., 1992). These results also support the work of Ansell and Pagliaro (2006) and Pagliaro and Ansell (2012) who found that *compare* word problems were more difficult for DHH students than combine and change word problems.

While slightly more reversal errors were made by DHH students on inconsistent language problems when the relations are negatively marked (e.g., *less*) compared to positively unmarked items (e.g., *more*), there was no significant difference between the two conditions. This finding confirms our second hypothesis and is counter to those of previous hearing and DHH studies which indicated that reversal errors for inconsistent language problems increased when the relational statements included negative marked terms (e.g., *less*, *shorter*, *younger*, and *1/n as much*) than those problems that included positive unmarked terms (e.g., *more*, *taller*, *older*, and *n as much*) (Lewis & Mayer, 1987; Pape, 2003; Verschaffel et al., 1992; for DHH college students, see Kelly et al., 2003).

That DHH junior high students in the present study produced more errors on word problems that contained fraction-of-a-number terms than with problems without such terms confirms our third hypothesis. This finding was expected given that it is well documented that DHH students lack a basic understanding of fractions. Previous studies reported that DHH students do not understand how to execute calculations with fractions nor do they have the understanding of other aspects of fractions such as order and equivalence (Titus, 1995). Students also have difficulties with concepts related to part to whole (Kelly & Mousley, 2001; Markey et al., 2003), placement in order from smallest to largest (Mousley & Kurz, 2015), comprehending the relationship between fractions and ratios (1:3 and 1:4) (Nunes & Moreno, 2002), and understanding fractions embedded in compare word problems (Lee, 2010).

LIMITATIONS AND FUTURE RESEARCH

The students in the present study were from a residential school that used ASL and English. Future studies may want to enlarge the sample and include junior high students who are from oral backgrounds, total communication backgrounds, including those who use digital hearing aids and cochlear implants. A second limitation is the amount of time DHH students were given to read and solve the word problems. Future studies may provide more time to complete the word problems to examine the effects. A third limitation is that no assessment of sign language skills was obtained. Future research can address this limitation by utilizing a standardized sign language assessment, similar to that used by Ansell and Pagliaro (2006) and Pagliaro and Ansell (2012). A fourth limitation is the

wide range of reading levels found among the 13 students. Two of the students had reading levels of 2.5 and 4.0, respectively, whereas the reading levels of the word problems were between 4th and 5th grade. A decision was made not to rewrite the compare word problems because this would invalidate the study since one of the foci was to examine relational language embedded in story problems. Future studies can match reading levels with the reading levels of the word problems more closely. A fifth limitation is the manner in which the errors were coded. It is possible for a student to make a reversal, computation, or goal-monitoring error *within* a fraction error, and these errors may be important because they may affect arriving at the correct answer. Future studies may help clarify this issue to determine how the fraction error code relates to the other error codes. Future studies may also provide more criteria for each error and add an independent coder to ascertain inter-rater coding reliability.

Future research may also explore the importance of teacher preparation in math areas, including math teaching state licensure given that multiple studies reported that many teachers are simply not prepared sufficiently in mathematical teaching (Corredor & Calderon, 2010; Kelly et al., 2003; Pagliaro, 2015). Innovative interventions such as cognitively guided math instruction as recommended by Carpenter and his colleagues (2015) should be examined. The present study indicated that DHH students need modeling so they can develop visual mental representations of mathematical relationships.

The DHH students in previous studies (Ansell & Pagliaro, 2006; Frostad & Ahlberg, 1999; Kelly et al., 2003; Serrano Pau, 1995) became “stuck” as they focused on surface structure strategies such as numbers, key words, or trigger words, or translation strategies thinking that *more* always means addition and *less* always means subtraction, without using their inference skills to see what the story problem required. Alternatively, students may also be bypassing a *meaningful approach* and fall into translating the story word-by-word, thus missing on figuring out what the relational language meant. DHH students may benefit from teacher-talk that focuses on *deep thinking* about mental representations of mathematical relationships such as those suggested by Corredor and Calderon (2010). This mathematical “teacher-talk” must proceed beyond sign translation and lead the students into extended conversations about mathematical relationships such as those that the compare word problems pose.

Teaming a CDI (Certified Deaf Interpreter) to work alongside of a signing teacher with mathematic training to provide not only linguistic support but also cognitive and math scaffolding to teach mental representations of arithmetic relational language using cognitively-guided instruction could be tested in future intervention studies.

Future researchers with DHH students examining compare word problems may want to explore other methodological protocols such as those used with hearing students to test the consistency effect hypothesis such as eye-tracking protocols (Hegarty et al., 1995; Hegarty et al., 1992), think-aloud or verbal reports (Pape, 1998, 2003), and retellings about solution steps (Verschaffel, 1994; Verschaffel et al., 1992).

CONCLUSION

Compare word problems are difficult to solve not only for DHH students, but for hearing students as well (Carpenter et al., 2015). But not all *compare* word problems are alike. Those with inconsistent language are more difficult to solve than those with consistent language (Lewis & Mayer, 1987). And when fraction-of-a-number terms are added to the mix, they become even more difficult to solve because these problems contain linguistic forms that do not map onto the students' existing conceptual knowledge structures. As such, a student may understand part-to-whole set relations, but may not understand comparative verbal forms such as "If X is $1/n$ as many as Y, how much is X?" As the present study and other studies indicated, when providing word problems of any kind, DHH students may lack both mathematical conceptual and linguistic tools to solve them (Pagliaro, 2015; Pagliaro & Kritzer, 2013).

This lack of mathematical conceptual tools for DHH students creates a "math gap" that starts as early as preschool (Ansell & Pagliaro, 2006; Kritzer, 2009; Pagliaro & Kritzer, 2013), follows them into elementary school (Zarfaraty et al., 2004), into middle school (Lee, 2010), and even into postsecondary education (Kelly & Mauseley, 2001; Kelly et al., 2003). Not only has this "math gap" in achievement been documented in the United States (Traxler, 2000), but also, similar math gaps have been found globally with DHH students in Columbia, South America (Corredor & Calderon, 2010), in Spain (Serrano Pau, 1995), in Norway (Frostad & Ahlberg, 1999), and in England (Swanwick et al., 2005).

Linguistic difficulties also contribute to the "math gap." DHH students have problems with math terminology

(Serrano Pau, 1995), particularly relational terminology (Kidd et al., 1993; Zevenberger et al., 2001). These multiple meaning words take on new meanings when they occur in mathematical contexts (Paul, 2009). Linguistic challenges also extend beyond the word and phrase level to other syntactic structures such as pronominal reference (Swanwick et al., 2005) and question formation (Zevenberger et al., 2001). Paul (2009) provided a robust discussion of DHH readers' challenges not only with question formation but also pronoun usage, determiner usage, conjoined sentences, relative clauses, and passive voice. These specific English structures that DHH students find problematic are abundantly found in junior high math textbooks and on practice tests. See, for example, the State of Texas Assessment of Academic Readiness (STAAR) tests (https://tea.texas.gov/student-assessment/STAAR_Released_Test_Questions/). Even when word problems are translated into a signed language, this does not necessarily lead to comprehension of math concepts (Ansell & Pagliaro, 2001; Corredor & Cladker, 2010; Pagliaro & Ansell, 2012). The translation of compare word problems may be necessary for signing DHH students, but it is not sufficient. DHH students were found to overuse a "counting strategy" where they focused on the quantity (number) and continued to count a sequence to the second quantity (number), then decide on an arithmetic operation based on a "key" or "trigger" word (e.g., *more* means addition; *less* means subtraction). This counting strategy did not result in correct answers, but may have emphasized that teachers focus too much on procedural operations rather than assisting the students into "thinking through" the story problem.

As such, the difficulties DHH students in junior high face are more extensive than arithmetic conceptual understandings, procedural mistakes, linguistic terminology or even their proficiency in a signed language. DHH students as shown by their performance in the present study simply did not know how to "think like a math person" who has a mental representation of relational language embedded in the *compare* word problems. Instead, as found in the literature, DHH students attacked word problems using surface structure strategies such as focusing on key or trigger words or on the numbers, used their own schema, and chose operations based on key words rather than using inference skills to arrive at the correct solution. Until teachers figure out how to teach these underlying mental mathematical representations of *compare* word problems through cognitively guided and engaged lessons, DHH students will continue to struggle.

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THE PREVALENCE OF DIFFERENT TEACHING METHODS IN INCLUSIVE EDUCATION

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ABSTRACT

Teaching methods represent the basic, regulatory elements of the teaching process. The aim of this study was to investigate the prevalence of different methods in inclusive Serbian schools. The sample consisted of 16 elementary schools attended by pupils with sensory impairments (visual and auditory impairments: N=69). 382 school classes of sixth and seventh grade were systematically observed to register the frequency of method used. Results have shown that the most frequently used method was the monologue (39,7%) followed by the dialogic method (39,2%) while other methods were used far less often (written/graphic presentation (12,3%), working with text (5,8%) and demonstration (2,8%)). The quality of teaching can be significantly lowered if one method is predominantly used in class. Implications for more effective teaching in inclusive schools are discussed, with special regard to pupils with sensory impairments.

Keywords: *inclusive education, dialogic method, monologic method, teaching methods, pupils with sensory impairments*

INTRODUCTION

Teaching methods are the fundamental elements of the teaching process that regulate its course and the activity of its participants in achieving specific goals (Pranjić, 2005; Meyer, 2002). In other words, methods represent the patterns of communication between the teacher and pupils which are adjusted to pupils' characteristics and needs in order to construct knowledge (Buljubašić Kuzmanović, & Petrović, 2014). The methodological structure and diversity enables learning and makes its acquisition easier.

The number and classification of teaching methods vary through the pedagogical literature. In this study, the methods of interest were the monologic method, dialogic method, written/graphic presentation, working with text and demonstration. These methods are most commonly used in Serbian schools and frequently researched in the field. It is important to stress that no teaching method by itself is sufficient to answer the demands of modern education whose emphasis is on the functionality of knowledge. On the contrary, it is the balanced combination of different teaching methods that can appropriately address these demands.

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The desired outcome of modern education is in line with the trend of inclusion that postulates the equal and active participation of each pupil, regardless of impairments or disabilities. It tends to provide an optimal development of the personality, knowledge and skills for every child, minimizing the negative influence of an impairment for children who have it. Thus, the adaptation to individual differences and the group of pupils implies that one teaching method is far from enough (Walsch, 2002). Inclusive schools and their teachers need to guarantee the adequate support for their pupils, and one of the most relevant aspects of it is a meaningful organization of the class structure (Jablan & Kovačević, 2008). Traditional schooling often establishes one or two dominant teaching methods (or forms of work) and perpetually relies on them. This can lead to the routinization and formalization of the class, creating an asymmetry in the activity of its agents. Consequently, the quality of learning and communication can notably decrease. For that reason, the implementation of inclusive practice represents a challenge the whole educational system, the teachers and finally, the learning process itself (Booth & Ainscow, 2010).

It is also important to notice that the application of teaching methods requires certain transformations when pupils with impairments are included in the class, in order to be effective. In this study, the main focus is on children with visual and auditory impairments. Hence, the examples for transformations include: the seating order, which may need to be rearranged, different assisting tools that need to be prepared and correctly used, reformatting the class subject and providing additional attention and support (see Communication Access and Quality Education for Deaf and Hard-of-hearing Children 1999). The achievement of educational goals also depends on the way other pupils perceive difference, which the teacher can greatly influence. When individual differences are accepted, they can become the source for achieving the higher overall quality of class in terms of peer relations, learning and the wellbeing of pupils with impairments. The monologic method is often considered equal to the frontal form of work (*ex cathedra*), mainly because it rests on the unidirectional communication. The teacher is the most active agent of the class that gives an oral presentation, while pupils remain relatively passive. This method relies on the assumption that the knowledge can be transmitted through listening. Research only partially supports this, suggesting that the monologic method is efficient, but not more efficient than other methods (Bligh, 1998). More specifically, its applica-

tion is appropriate when basic information is needed (for example, an introduction to certain material or while making final conclusions) or when new information is introduced. With the use of monologue, the content of the class can be presented systematically, logically and economically, however the quality of its realization is entirely the teacher's responsibility (Terhart, 2001). When pupils with sensory impairments attend class, the teacher needs to consider everything from the seating arrangement, multimedia support, the characteristics of his speech to the proper use of tools (depending on the type of impairment), in order to be certain that the subject is understandable. Yet, when the monologic method is overly used, it can have negative consequences. The aforementioned unidirectionality of communication, regardless of the level of structure the speech has, can distance the teacher from pupils as well as pupils from each other, resulting in the "collective of disconnected individuals" (Watkins, 2005, p. 21). As such, the monologue can inhibit authentic conversation (Skidmore, 2000) and it can make the learning process severely more difficult and even rigid. Therefore, it is crucial to combine it with other methods than lean on the social aspect of learning.

The dialogic method includes direct, two-way interaction on the pupil-teacher and pupil-pupil relation. It is based on questions, answers and discussion. Its focus on specific goals and the teacher's preparation for discussion separates it from "normal" or "casual" conversation. Sometimes it is regarded as the method of the greatest cognitive potential, because it requires from pupils a deeper level of information processing (Lyle, 2008). Although it can have many different forms and can be used in many settings, its biggest value lies in the social and emotional bonding between pupils (Burbules, 1993). Dialogue helps pupils acquire communication skills, giving them the opportunity to explore ideas and question facts (Egan, 1992), enabling the active construction of meaning (Lyle, 2008) and finally, encouraging an accepting atmosphere for pupils with disabilities who feel they can contribute (Alexander, 2006). However, when using this method, it must be ensured that all pupils are prepared and motivated for discussion (Burbules, 1993). The differences in skills, preferences and communication styles can be difficult to handle. Nevertheless, pupils with sensory impairments need to have the opportunity to hear others and be at liberty to state their own opinion or ask questions. Similar to monologue (or any other method), when dialogue is used extensively (especially if the use is improper), it can prove counterproductive and exhaustive.

The method of demonstration includes additional elements (e.g. using a model, an object, an experiment, a clip showing a process etc.) that serve to prove and/or clarify the subject of the class. This method is very useful for connecting theory to practice, or when the theory is too abstract or difficult for pupils to understand (Freire, 2000). Demonstration activates pupils in a way that enables them to try out what the teacher is doing or talking about (for instance, in the laboratory), thus reinforcing their knowledge. It has a great potential because it can cover a variety of class material. Even the discussion can be classified as a demonstration if it is used for the purpose of learning what discussion is and how it is used (Hoover, 1958). When pupils have the task of demonstrating something as a group, the demonstration method gains the value of the dialogic method as well in terms of socialization. In its implementation it is important to take into account the level of knowledge pupils already have and individual capabilities in relation to the task (Glasson, 1989). Moreover, the teacher needs to accurately assess the usefulness of demonstration when considering the specific goal of the class, i.e. judge whether it will be clear to everyone and is it better to use a different method for the same purpose.

Acquiring knowledge through the written word and manual graphic representation is common to the methods of text processing and written/graphic presentation (Cruikshank, Bainer & Metcalf, 1995). More specifically, these methods include reading, writing and drawing (with other techniques of graphic representation). It goes without saying that these methods are necessarily used with the others, such as demonstration or the monologic method. The great advantage of using text processing and presentations is in its application to all of the school subjects and in all phases of work. However, the most important condition for the success of their use is the students' ability to use various materials. Therefore, the pupils with visual impairment, for instance, need to be provided with a substitution or additional assistance in working with text. When assigning pupils with a task, it is very important to ensure that all pupils understood what they should be doing (and encourage asking additional questions), giving them enough time to work in their own pace.

As noted previously, the diverse and purposeful use of all teaching methods described in this article is crucial for effective teaching that meets the demands of modern education. Research often stresses out the relevance of transition from monologic to dialogic method. One of the barriers to cooperation between pupils and to the participation of pupils with sensory impairments is the dominance of monologue which is naturally established by the power-relations in the classroom (Lyle, 2008). Additionally, many teachers don't have sufficient classroom management skills necessary for adequate planning of the available class time. This implies the relevance of empowerment and motivation of the teachers, as they are the main carrier of inclusion. They need to be directed towards concrete and practical guidelines for the variety of situations in the classroom, and be encouraged to update their knowledge (Meyer, 2002). Having in mind the strengths and weakness of each of the teaching methods, the context of their application in inclusive education and the relevance of balance in their use, the aim of this study was to examine the frequency of their use in Serbian inclusive practice. So far, there has not been a lot of similar studies based on systematic observation and that included pupils with sensory impairments. Answering this research question might lead to the greater understanding of the inclusive educational system, point to the potential problems and finally, produce concrete suggestions for improvement.

METHOD

The sample consisted of 16 elementary schools in the Republic of Serbia attended by pupils with sensory impairments (N=69). Schools were chosen according to the information about the number and distribution of enrolled pupils with sensory impairments. The study was conducted using systematic observation. One school class was equivalent to one observation unit, and one observation unit was separated additionally to the introductory, central and the final part of the class. 382 sixth and seventh-grade classes were observed in total, as seen in Table 1.

Table 1. Observations per grade

Grade	f	%
Sixth	200	52,4
Seventh	182	47,6
Total	382	100,0

The sample of pupils with sensory impairments consisted of blind, partially blind, deaf and partially deaf

pupils. The structure of the sample is presented in Table 2.

Table 2. Type of impairment

Type of impairment	f	%
Blind	5	7,2
Partially blind	35	50,7
Deaf	12	17,4
Partially deaf	17	24,6
Total	69	100,0

The systematic observation was used according to the protocol for recording the teaching process. It consists of instructions for documenting the classroom space adaptation, forms of communication, classroom organization and use of teaching methods tools. As such it was assessed as appropriate for the present research goal, i.e. for collecting data on the frequency of teaching methods.

RESULTS

In relation to the prevalence of teaching methods, the results are grouped into the following observation units: the class as a whole, introductory, central and

the final part of the time. Looking at the whole class, the monologic method is predominantly used. The next most common method is the dialogue, being almost equally present as the monologue. Demonstration is the least frequently used teaching method. The percentage of method use is presented in Table 3. The methods used in the introductory part of the class are the monologue and the dialogue which are prevalent to an equal degree. Written/graphic presentation, working with text and demonstration are used to a significantly less extent. These results are not surprising, because the introduction usually serves to present new information or to reflect on previous work.

Table 3. Teaching methods in the class

Type of impairment	f	%
Blind	5	7,2
Partially blind	35	50,7
Deaf	12	17,4
Partially deaf	17	24,6
Total	69	100,0

The prevalence of methods in the introductory part of

the class is presented in Table 4.

Table 4. Teaching methods in the introductory part of the class

Teaching methods	f	%
Monologue	174	45,5
Dialogue	174	45,5
Written/graphic presentation	14	3,7
Working with text	10	2,6
Demonstration	10	2,6
Total	382	100,0

According to Table 5, the dialogue is the most frequent method used in the central part of the class. Monologue is used to a lesser extent, and written/graphic

presentation follow. Demonstration and working with text are not used as often as other methods.

Table 5. Teaching methods in the central part of the class

Teaching methods	f	%
Dialogue	140	36,6
Monologue	111	29,1
Written/graphic presentation	86	22,5
Working with text	33	8,6
Demonstration	12	3,1
Total	382	100,0

In the final part of the class, the monologic method is predominant. Here, the dialogue is used significantly less, as well as the written/graphic presentation. Demonstration and working with text take, similarly to the

introductory part, a negligible little percentage of the time. The frequency of teaching methods in the final part of the class is present in Table 6.

Table 6. Teaching methods in the final part of the class

Teaching methods	f	%
Monologue	171	44,8
Dialogue	135	35,3
Written/graphic presentation	41	10,7
Working with text	24	6,3
Demonstration	11	2,9
Total	382	100,0

The results clearly indicate that the monologic and dialogic method are methods which are prevalently used, while their combination is rarely applied. Other methods are used to a significantly less degree. Written/graphic presentation is used mostly in the central part of the class. Overall, it is visible that the data for the introductory part and the class as a whole is very similar, and that the central part of the class is the only part where dialogue is used more often than the monologue. Having in mind the critiques of traditional education, these findings are in accordance with its subject and the presented literature.

DISCUSSION

This study had the goal to investigate the prevalence of teaching methods in inclusive schools in Serbia that pupils with sensory impairments attend. The results show that the monologic method is predominantly used. The next most commonly used method is the dialogue. The difference in percentage between them is smaller when the observation is split into parts of the class, but looking at the class as a whole, the monologic method prevails. Additionally, these two forms of communication that naturally go together, are used

separately in observed classes. The least frequent methods in all observational units are working with text, written/graphic presentation, and demonstration, respectively. These results suggest that the traditional approach is still prevalent in schools. Therefore, it is reasonable to question how many opportunities pupils have to fully engage in class, especially children with sensory impairments. The prevalence of monologue, with the negligible use of methods such as demonstration and text processing (i.e. those that consolidate knowledge) brings into consideration the general adaptation of class and the level of understanding pupils reach. The monologic method alone, regardless of its practicality, can neglect the social component of knowledge and distance all the agents of the class. Furthermore, despite the fact that the dialogue is used almost as much, it remains uncombined with monologue and other ways of processing material as well. The dialogic method and its diversity of application can undoubtedly be difficult for realization, but it should not be seen as a separate, or an "advanced" method because of that. Rather, it should serve as the connective tissue of class. The bidirectional communication can, therefore, be a starting point for the achievement of inclusion.

CONCLUSION

In executing a curriculum that is time-limited in practice, the teachers have the task to use the material in such a way that all pupils achieve their educational goals, behave as a cooperative, close community and adapt to the needs of pupils with sensory impairments. For that reason, enhancing teachers' competencies and stimulating them to the teaching methods equally is necessary in inclusive practice. Future research could address the ways of upgrading the practice of teaching when pupils with sensory impairments attend class with others. Also, a more thorough analysis of the teaching methods from the pupils' point of view (if possible, a qualitative one). It can contribute to our understanding of how pupils react to patterns of communication in class, and how the methods can be accordingly approved. By researching and resolving these, as well as other important current issues of our educational system, researchers can also indirectly advance the society as a whole, in which each member is given the opportunity for a unique contribution and for the realization of personal potentials.

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DIFFERENCES IN SPATIAL ORIENTATION IN CHILDREN WITH AND WITHOUT VISUAL IMPAIRMENT WITH REGARD TO AGE, GENDER AND SCHOOL ACHIEVEMENT

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ABSTRACT

The aim of the research is to examine the differences in the spatial orientation of children with and without visual impairment with regard to age, gender, and school achievement. The sample of respondents consisted of a total of 62 respondents, of whom: 31 respondents with visual impairment and 31 respondents without visual impairment, aged 7-11, both sexes obtained from the pupil population from the first to the eighth grade of regular primary schools in the Tuzla Canton area. The obtained results were processed by descriptive analysis, t-test and variance analysis. By analyzing the results on variables for the estimation of spatial orientation, we can conclude that the two investigated groups statistically significantly differ in spatial orientation with regard to: age, while the differences were not shown on the variables: gender, and school achievement. The results of the research can be used to create new methods for implementing and improving the rehabilitation process in this population of children. Rehabilitation with children with visual impairment can positively influence the reduction of the differences in the spatial orientation of this population in relation to children of intact vision, and on the educational process, social and professional integration of this population.

Keywords: *spatial orientation, children with visual impairment, children without visual impairment*

INTRODUCTION

The sense of vision (eyesight) is a complex organ by which the human establishes the most important and most perfect sensory connections with the environment (Smiljanić, 2001). The eyesight is one of the senses with which we notice, we discern the light, colors, shapes, distances and spatial relationships (Stefanović, 1996). The eyesight allows identification

of objects, events, people, much more successful than other sensory-perceptual channels (Warren, 1981). Visual impairment is a major and growing health and socioeconomic problem (Courtright et al., 2011). The frequency of visual impairment caused by genetic and incurable neurophthalmic diseases is on the rise, such a complex etiology of visual impairment often causes multiple difficulties in children (Boonstra et al., 2012).

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Perception is structured by the laws of the perceptual organization (Wertheimer, 1999). The space is perceived by the integrative cooperation of all senses. Space is the environment in which we find what we perceive, one from one another (Marić, 1991). In this same space we perceive that objects are localized in different places, we hear where they are and we touch them in different places of space (Crutch & Crutchfield, 1980). Visual information has the most important integrative function in linking information from various perceptual modes (visual, audible, tactile) to one whole in the perception of space (Ognjenović, 1992). The process of object perception distinguishes three stages: object discrimination, object recognition and identification. The perception of the third dimension of objects is very complex and involves binocular vision, eye movements and cognitive information processing. It is important to keep in mind that the perception of a particular object is more than something that has a certain size, shape, color, movement. It should be noted that visual attributes have a dominant role in the perception of objects, but most often in the integration with information from other senses (Eškirović, 2002). The perception of the space of visually impaired children has a strong influence on the constellation factors: the illumination of the perceived spaces and the exclusion of the object space. Saturation and other dimensions of colors in perceived objects in space and size of objects, etc., also play a significant role. Of the internal factors for perception of space, the most important are the physiological factors: the type of visual impairment, visual acuity, the width of the visual field, the quality of stereoscopic vision. The monocular perceptions of the depth space are several times slower than the binocular perceptions. The lack of visual control of these situations leads to difficulty in adopting their meaning in children with visual impairment (Tulumović & Husić, 2017). The biggest problem in space perception is the perception of the third dimension-depth, as well as the ability of spatial analysis and synthesis. Educational abilities of children with impaired vision are largely based on the quality of visual perception of space (Tulumović et al., 2013). These children have a lot of difficulty in perceiving perspectives, orientation in space and stability in the perception of space. Partially sighted children with usable vision on both eyes, but with certain deviations in binocular vision, will have significant difficulties in space perception. Particularly expressed are the difficulties of partially sighted children whose visual

impairment as a cause of amblyopia (partial sight) is accompanied by strabism. According to Zemcova, on the sample of the visually impaired children and children of intact vision in the fixation of the view, the assessment of the depth of the area, the monitoring of moving objects, the disturbances in the motor mobility of their eyes will be directly reflected in spatial analysis and synthesis. In the experimental study (Filin, 1987, according to Eškirović, 2002), on the sample of visually impaired children and children of intact vision it was found that all the visually impaired children showed significant deviations regarding the fixation of a bright or imagined point in the space. It is very important, in addition, to determine at what distance the partially sighted student specifically perceives the movements of teachers and students in the classroom. Characteristics are conditioned by reduced visual capabilities, which make it difficult for them to get to know the outside world. In the formation of teaching with children with visual impairment, the key role is to learn about their cognitive, perceptual and motor abilities (Tulumović, 2013). Partially sighted children for the perception of the environment, other than the remaining senses, also use the rest of the sight, but they also need more time. On the other hand, the concept of the need for organizing teaching activities that will enable these children to make the most efficient use and minimum capacities of the visual system is based on examples from corrective teaching and the results of various researches (Tulumović et al., 2012). Partially sighted children show significant deviations in discrimination of the basic characteristics of perceived objects and model objects in a classroom and in another environment. In the previous research, the greatest difficulty is registered in terms of the form and structure of the object. An increasing number of partially sighted students exhibit certain difficulties in naming the most elementary objects of everyday life. It is very important to determine what is the ability of partially sighted children to identify the model of an object that is familiar to them in their natural form. Failure to solve these tasks can be the result of: inability to notice any difference, misunderstanding of terms of similarity and discrimination, failure in the percentage of searches and observations. Significant information on the peculiarities of the visual observation of the partially sighted children in the teaching can be obtained on the basis of how to solve tasks and matching identical models in a series of objects (Eškirović, 2002, according to Omerćehajić, 2017).

AIM OF THE WORK

To determine the differences in the spatial orientation of children with and without visual impairment with regard to age, gender, and school achievement.

METHODS

Sample respondents

The sample of respondents consisted of children with visual impairment, elementary school age and children of intact vision, who, by age and gender, were equated with an experimental group. The survey covered a total of 62 respondents: 31 visually impaired respondents, 31 respondents without visual impairment, aged 7-11, both genders. Children with visual impairment who are integrated in regular schools in the Tuzla Canton area and children of intact vision who attend regular school in the Tuzla Canton area. The selection criteria were: children with visual impairment, without intellectual disabilities, both genders, aged 7 to 11.

Measuring instruments and method of conducting research

The research was conducted in regular elementary schools in the Tuzla Canton. Preliminary preparations were made in schools, which consisted of detailing the way in which the examination was conducted to students. The parents of children with visual impairment, as well as parents of children without visual impairment, school directors and teaching staff, were introduced to the method of examination. The test was conducted individually. In the study of spatial orientation

in children with visual impairment, a "Diagnostic kit for testing the ability of speech, language, reading and writing in children" was used (Bjelica & Posokhova, 2001).

Data processing methods

Data processing was carried out using the SPSS 17.0 for Windows software package. In addition to calculating the descriptive-statistical parameters, the measure of central tendency and variability, the test of the difference (equity) of the arithmetic meanings of two or more basic sets was used as a parameter test. To test the existence of a difference in mean values between groups of respondents formed by age (independent samples), as well as other criteria, a p-value was used. As nonparametric tests, chi-squared test and t-test for the significance of differences in the arithmetic mean of variables, variance analysis was used. The survey was conducted with a level of significance of 5% (.05).

RESULTS

In order to determine the differences in relation to the obtained results of spatial orientation in children with and without visual impairment in relation to gender, a t-test was applied. Based on the results obtained in Table 1, it can be seen that male respondents achieve better results on variables "Spatial Orientation", "Reproducing Directions," "Reproduction of Spatial Orientation and Spatial Practices", and "Ability to Verbal Motion Control", while female respondents achieve better results on the variable "Ability to adopt concepts". Although differences in the achieved results have been established, they are not statistically significant.

Table 1. Analysis of t-test results in spatial orientation among children with and without visual impairment with regard to gender

Variables	Gender	AM	SD	t	p
Spatial Orientation	Male	2.00	0.89	1.38	.179
	Female	1.53	0.99		
Reproducing Directions	Male	2.81	0.40	1.49	.148
	Female	2.47	0.83		
Reproduction of Spatial Orientation and Spatial Practices	Male	1.69	0.87	.56	.581
	Female	1.47	1.30		
Ability to Adopt Concepts	Male	1.38	0.96	-.06	.950
	Female	1.40	1.24		
Ability to Verbal Motion Control	Male	1.69	1.08	.56	.581
	Female	1.47	1.13		

Table 2 shows the results of the t-test with regard to the age of respondents with and without visual impairment. Based on the obtained t-test results, it can be concluded that there is a statistically significant difference in relation to the age of respondents and variables related to: „Spatial Orientation“ ($t = -3.94$;

$p = .000$), „Reproducing Directions“ ($t = -3.67$; $p = .001$), „Reproduction of Spatial Orientation and Spatial Practices“ ($t = -5.36$; $p = .000$), „Ability to Adopt Concepts“ ($t = -4.64$; $p = .000$), and „Ability to Verbal Motion Control“ ($t = -2.38$; $p = .024$). All results obtained support the respondents aged 10-11.

Table 2. Analysis of t-test results in spatial orientation among children with and without visual impairment with regard to age

Variables	Age	AM	SD	<i>t</i>	<i>P</i>
Spatial Orientation	7-9 Years old	1.20	1.01	-3.94	.000
	10-11 Years old	2.31	.48		
Reproducing Directions	7-9 Years old	2.27	.80	-3.67	.001
	10-11 Years old	3.00	.00		
Reproduction of Spatial Orientation and Spatial Practices	7-9 Years old	.80	1.01	-5.36	.000
	10-11 Years old	2.31	.48		
Ability to Adopt Concepts	7-9 Years old	.67	.98	-4.64	.000
	10-11 Years old	2.06	.68		
Ability to Verbal Motion Control	7-9 Years old	1.13	1.13	-2.38	.024
	10-11 Years old	2.00	.89		

In order to determine the differences in relation to the variables of spatial orientation in children with and without visual impairment with regard to the school achievement, a univariate variance analysis was applied. Based

on the obtained results of the univariate variance analysis shown in Table 3, it can be concluded that there is no statistically significant difference in relation to the variables of spatial orientation and school achievement.

Table 3. Analysis of the results of the F-test in spatial orientation among children with and without visual impairment with regard to school achievement

Variable	Group	SS	df	MS	<i>F</i>	<i>P</i>
Spatial Orientation	Among	1.31	2	.65	.70	.50
	Within	26.10	28	.93		
	Total	27.41	30			
Reproducing Directions	Among	.38	2	.19	.42	.65
	Within	12.70	28	.45		
	Total	13.09	30			
Reproduction of Spatial Orientation and Spatial Practices	Among	.07	2	.03	.02	.97
	Within	35.47	28	1.26		
	Total	35.54	30			
Ability to Adopt Concepts	Among	5.64	2	2.82	2.66	.08
	Within	29.70	28	1.06		
	Total	35.35	30			
Ability to Verbal Motion Control	Among	.09	2	.04	.03	.96
	Within	35.45	28	1.26		
	Total	35.54	30			

DISCUSSION

Partially sighted children for the perception of the environment use all their senses. In the period of mastering compensatory skills, visual perception of these children is distinguished by: sluggishness, fragmentation, unsystematicness. Highly sighted children at the beginning of schooling have more serious problems in establishing the need to extract the necessary information from the screened images on the retina. Regarding the relation between visual efficacy and visual impairment as a cause of amblyopia, it is certain that partially sighted children within certain categories of visual impairment show certain specificities in the visual perception of teaching material. Partially sighted pupils with high myopia have the need to observe objects, models, drawings from very close distances. In this way, the model can be taken as a whole or an optimal part. Partially sighted pupils with hyperopia have a lot of difficulty in perception of objects, models, images and text (Dikić, 1988). The eyesight is one of the five senses, and through which we notice, we discern the light, colors, shapes, distances and spatial relationships. Therefore, rightly it is today that man is primarily a visual being (Stefanović, 1996). The eyesight is also important for conceptual development and plays an important role in the development of the concept of an object, in the understanding that an object exists, it lasts even when it disappears from immediate observation. The eyesight enables the identification of objects, events, and people, much more successful than other sensory-perceptual channels (Warren, 1981). In the Dikić research, it was established that the visually impaired children of elementary school age of different categories of visual disturbance or visual impairment show certain specificities within the basic areas of visual perception. For high partially sighted children, visual acuities of up to 0.1 of the heaviest tasks were in the areas of visual perception, eye coordination, discrepancy between figures and backgrounds and continuity of the form. Regarding the influence of the visual field on visual efficiency of slightly sighted pupils, the data are very small, children with a wide field of vision reaching up to 5 degrees can look at items of 5 centimeters in size. Children with a field width of 5-15 degrees can cover subjects up to 15 centimeters in height at a distance of up to 33 centimeters. Partially sighted children with significantly narrowed field of vision reaching 30 or 40 degrees, on one or both eyes, have a significantly endangered binocular and stereoscopic vision. The perception of the shape and size of objects, text, and complex teaching

material is difficult. Regarding the relation between visual efficacy and visual impairment as a cause of amblyopia, it is certain that partially sighted children within certain categories of visual impairment show certain specificities in the visual perception of teaching material (Eškirović, 2002). The perception of the space of partially sighted children has a great influence on constellation factors: the illumination of perceived space and the fulfillment of space by objects. Saturation and other dimensions of perceived objects in the space, the size of the object have a significant role as well. Disorders of motor mobility of their eyes will directly affect the spatial analysis and synthesis. In assessing the development of visual efficiency in object classification, it is very important to engage a partially sighted student in solving the task of allocating a model that, by certain elements, differs from the presented models with the same name in a series (Faye, 1976). Gayleenne (1990) carried out a study of the characteristic of the perception of certain observational properties of the partially sighted pupils. The study was conducted on a sample of 80 partially sighted pupils of lower grades of elementary school and 80 of their peers of intact vision. As a data collection tool, series of pairs of objects and models are distinguished by one or more observational properties: color, form, structure, and size. The results showed that both groups were very successful in discriminating and matching objects based on color and size. Differences have been shown in the discrimination and matching of objects and models within the dimensions of form and structure, the differences obtained were in both cases (Eškirović, 2002). A similar study was conducted by Gayleane (1990) with 80 partially sighted students and 80 intact vision students where the relationship between visual acuity and object classification was examined. The results showed statistically significant correlation between visual acuity and success in classifying objects based on color, size, form, and structure (Eškirović, 2002).

CONCLUSION

Based on the analysis of the obtained results of the research itself, the following conclusion can be made: Based on the research carried out and the interpretation of the obtained results on the variables for the estimation of spatial orientation, we can conclude that the two investigated groups statistically significantly differ in spatial orientation with regard to: age, while the differences were not shown on the variables: gender, and school achievement.

Based on the results obtained, one could act preventative, by implementing an appropriate rehabilitation treatment at an appropriate age (early age, pre-school age, juvenile elementary school age, senior elementary school age). Elementary school age provides the most opportunities for permanent tiflological rehabilitation as part of regular and corrective classes.

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MOTOR DEVELOPMENT OF CHILDREN WITH VISUAL IMPAIRMENT

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ABSTRACT

The aim of this study was to determine the level of motor development of children with visual impairment and comparison with peers of typical development. The research sample consisted of a total of 135 children with visual impairment and children with typical development, 7-10 years old, of both sexes. The Bruininks-Oseretsky Test of Motor Proficiency, 2nd edition was used to estimate motor development. The methods of descriptive statistics, as well as the T-test of independent samples, and the Hi square test were used in statistical processing of the obtained data. The results of the study had shown that the level of motor development of the subjects with visual impairment was below and well below the average for their age. Typical development subjects are mostly within the average norms.

Keywords: BOT-2, motor development, students with visual impairments, vision

INTRODUCTION

Motor development can be defined as a gradual change in the motor behavior of each person, which is the result of the interaction between the personal characteristics, the environment in which the person is and the types of motor tasks that are being performed (Gallahue, 2002).

The deficit in any domain of child development affects the development of the remaining domains (Bigelow, 2003), so numerous findings indicate that children with visual impairments have a delay in motor development (Brambring, 2001; Houwen, Visscher, Lemmink, & Hartman, 2008; Howarth et al., 2003; Levtzion-Korach, Tennenbaum, Schnitzer & Ornoy, 2000; Wyver & Livesey, 2003).

The vision is one of the most important senses, as well as a complete or partial loss leads to very serious consequences in the development and life of a person (Angelopoulou-Sakantami, 2002, according to Fotiadou, Chtistodoulou, Soulis, Tsimaras, & Mousouli, 2014). Children with visual impairments are faced with difficulties in the domains of cognitive, social and motor development, and even very little visual impairment may disturb the domain of motor development, because the sense of sight closely related to motor skills, specifically with motor activity, programming and execution of movement (Brambring, 2006; Navarro, Fukuyama, Fontes, Matas & Prado, 2004, according to Daly, Malone, Burkett, Gabrys & Satkunskiene, 2009).

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When we say that the vision closely related to motor skills or motor abilities, this can be explained by the fact that a child observes their hands and fingers in such a way that he begins to examine and run them. This is the beginning of visuomotor control, which later plays an important role in the development of (psycho) motor skills (Bojanin, 1985). Visual impairments have a negative impact on general motor activity and can lead to developmental delays. The effect of visual damage is different for each stage of development (Reimer, Cox, Nijhuis-Van der Sanden, & Boonstra, 2011). As visual impairments have a negative impact on motor development, the negative impact is also manifested in the development of motor abilities and later on the acquisition of motor skills (Atasavun & Dulge, 2011; Bouchard & Tetreault 2000; Brambring, 2006, 2007; Reimer, Smits-Engelsman, & Siemonsma-Boom, 1999; Rutkowska et al., 2016; Zylka, Lach, & Rutkowska, 2013, all according to Sretenović & Nedović, 2018).

Numerous studies have identified deficits in motor development in children with visual impairments compared with their peers with typical development (Atasavum, Usal, & Aki, 2012; Fotiadou et al., 2014; Wyver & Livesey, 2003).

The aim of the research was to determine the level of motor development in children with visual impairment and whether there was a difference in the motor development of children with visual impairment and children of typical development.

METHODS

The sample

The research was carried out in accordance with the Helsinki Declaration on Ethical Principles for Medical Research Involving Human Subjects. The study was approved by the Professional Boards of the University of Belgrade (No. 61206-186 / 2-15). Taking into account that the subjects of the research were children, a written consent was received from the parents or the guardian. The survey sample included 135 children, aged 7 to 15, both sexes. The sample is divided into two groups. The first group of examinees consisted of 45 (33.3%) children with visual impairment, the average age 10.67 (SD = 3.337) years, both sexes (35.6% of boys) were

uniform compared to the full structure ($\chi^2 = 3.756$, $df = 1$, $p = .053$). The second group of respondents consisted of 90 (66.67%) children of typical development, the average age was 10.67 (SD = 3.318), both sexes (50% of boys).

Place and time of research

The research was carried out during the school year 2016/2017., in schools for the education of children with disabilities and regular primary schools located in the territory of the Republic of Serbia.

Research instrument

The Bruininks-Oseretsky Test of Motor Proficiency, Second Edition - BOT-2 (Bruininks & Bruininks, 2005) was used to evaluate motor development. This test has been widely used to evaluate motor development, or a wide range of motor skills in children aged 4 to 21. It consists of 8 subtests (fine motor precision, fine motor integration, manual dexterity, bilateral coordination, balance, running speed and agility, upper limb coordination and strength). By combining these subtests, four motor areas are obtained which by combining give the total motor composite score.

Statistical data processing

In the part of the preliminary analysis, the normality of the distribution of the obtained results was calculated using the Kolmogorov-Smirnov test, which further focused on the selection of parametric techniques because the normality, distribution and homogeneity of the variance were respected. For the descriptive statistics of categorical variables, the counting measures were used: the frequency (N) and the percentage (%), while for the descriptive statistics of numerical variables the measures of central tendency were used: arithmetic mean (M) and variation measures: standard deviation (SD) and standard error of average (SEM). Also, the T test for independent samples was used. The χ^2 test was used to analyze two categorical variables. All statistical analyzes had been assigned an α level of .05. The statistical package of SPSS for social sciences was used for data processing.

RESULTS

Table 1. The Average Achievement of Subjects with Visual Impairment and Subjects of Typical Development on BOT-2

BOT-2	Subjects							
	Visual impairment				Typical development			
	M	SD	Min	Max	M	SD	Min	Max
Subtest 1	4.02	2.911	1	13	7.31	1.647	3	12
Subtest 2	5.91	3.795	1	16	8.82	2.424	5	16
Subtest 3	3.84	2.449	1	9	11.27	3.576	5	23
Subtest 4	5.29	3.245	1	12	15.62	3.968	7	24
Subtest 5	5.36	3.206	1	18	13.12	4.019	7	24
Subtest 6	5.11	3.304	1	12	16.97	3.501	8	27
Subtest 7	5.09	3.872	1	16	12.49	4.404	5	23
Subtest 8	5.47	3.428	1	15	15.10	3.419	8	23
Total motor composite score	25.73	5.280	20	40	41.19	5.542	32	58

Average achievements on the subtests show that those with visual impairment achieved the worst achievement on subtest 3 (manual dexterity) and achieved the best average achievement on subtest 2 (fine motor integration). At the same time, in the group of subjects of typical development, the best average achievement was on subtest 6 (running speed and agility), while the worst result was obtained on subtest 1 (fine motor precision). If we compare the total motor composite scores of these two groups of subjects, we can see

that subjects of typical development ($M = 41.19$, $SD = 5.542$) are significantly better than those with visual impairment ($M = 25.73$, $SD = 5.280$) (Table 1). The T-test of independent samples found that there was statistically significant difference between these two groups of subjects ($t(133) = 15.51$, $p = .000$). The mean difference between the groups (mean difference = 15.46, 95% CI: 13.48-17.43) was large ($\eta^2 = .644$), and the type of development explains as much as 64.4% of the variance of motor development

Table 2. Descriptive Display of Achievement

Descriptive categories	Subjects				Total
	Visual impairment		Typical development		
	Male	Female	Male	Female	
Average	/	/	22 (16.3%)	22 (16.3%)	44 (32.59%)
Below average	3 (2.22%)	4 (2.96%)	23 (17.04%)	23 (17.04%)	53 (39.26%)
Well below average	13 (9.62%)	25 (18.52%)	/	/	38 (28.15%)
Total	16 (11.85%)	29 (21.48%)	45 (33.33%)	45 (33.33%)	135 (100.00%)

Based on the results given in Table 2, and according to the descriptive categories of motor development, we can say that compared to the total sample, only 44 (32.59%) of the subjects, and that typical develop-

ment subjects, are in the average for their age, while 39.26% of subjects are below average, and 28.15% well below the average.

Table 3. Average Achievement of Subjects with Visual Impairment and Subjects of Typical Development in Relation to Gender on the Total Motor Composite Score

Subjects											
Visual Impairment						Typical development					
Male			Female			Male			Female		
M	SD	SE _M	M	SD	SE _M	M	SD	SE _M	M	SD	SE _M
26.75	6.137	1.534	25.17	4.766	.885	41.53	5.806	.866	40.84	5.308	.791

T-test for independent samples were compared to the results obtained on the total motor composite score of subjects with visual impairment of both sexes as well as the subjects with typical development of both sexes. There was no significant difference in the results of boys ($M = 26.7$, $SD = 6.137$), and girls ($M = 25.1$, $SD = 4.766$) with visual impairment, $t(43) = .958$, $p = .343$. The difference between the median meanings by groups (mean difference = 1.578, 95% CI: -1.742 to 4.897) was small ($\eta^2 = .021$). The sexual difference explains only 2.1% of the variance of motor development. In the group of subjects with typical development, also there was no significant difference in achievement in boys ($M = 41.5$, $SD = 5.806$), and girls ($M = 40.8$, $SD = 5.308$), $t(88) = .587$, $p = .558$. The difference between the median meanings by groups (mean difference = .689, 95% CI: -1.642 to 3.019) was small ($\eta^2 = .003$), and sex explains only .3% of the variance of motor development.

DISCUSSION

With this research we wanted to examine the level of motor development in children with visual impairment, and to compare the motor development of children with visual impairment to children of typical development. Children with visual impairment, in relation to the descriptive categories of motor development, are in the category below the average and well below the average in relation to their age. It is very worrying that about 40% subjects of typical development are in the category below average. This result can be explain to today's way of life of children. There is a growing presence of sedentary lifestyles (Pate, Mitchell, Byun, & Dowda, 2011), an irregular diet that leads to either overweight or malnutrition (Bremer & Cairney, 2018), then spending spare time on a computer, tablet, or mobile phone, not in a park or playground. Our findings are partially confirmed by the findings of other studies, which stated that those with visual impairment belong to the category below average and respondents of the typical devel-

opment category above average (Fotiadou et al., 2014). It is evident that respondents with visual impairment have significantly lower achievements ($M = 25.73$, $SD = 5.280$) than their peers of typical development ($M = 41.19$, $SD = 5.542$), which is somewhat expected, and numerous studies suggest that the vision is the dominant sense in humans (Bouchard & Tetreault, 2000; Levzion-Korach et al., 2000, all according to Haegele, Brian, & Goodway, 2015; Hashemi, Dehghani, Saboonch, Roozbahani, & Roonasi, 2012), and have a very important role in acquiring motor skills, ie children with visual impairment have less developed motility than children of typical development (Aslan, Calik, & Kitis, 2012; Houwen, Hartman & Visscher, 2009; Kozub & Oh, 2004; Lieberman & McHugh, 2001). Delays in acquiring motor can be one of the factors that contribute to the differences between these two groups of children (Houwen, Visscher, Hartman, & Lemmink, 2007; Houwen, Hartman, Jonker, & Visscher, 2010). The expectation and justification of the results that the subjects with visual impairment have significantly lower achievements than the subjects of typical development, are also reflected in the fact that the type of development explains as much as 64.4% of variance in motor development, according to the results of this study. If we observe the achievements on the subtests, we can say that for those with visual impairment the best developed is a fine motor integration, and the worst manual dexterity. The data in the literature state that the subjects with visual impairment had the greatest delay in dribbling and catching the ball (Houwen et al., 2010; Wagner, Haibach, & Lieberman, 2013), which is not in accordance with our findings. Between boys and girls with visual impairment, as well as boys and girls of typical development, no statistically significant difference was found on the total motor composite score, and sex explains the extremely low percentage of variance in motor development. In other words, gender has no significant role in the development of motor abilities, respectively motor development.

Confirmation of our results found in other studies (Cameto & Nagle, 2007; Pereira, 1990). However, there are also studies whose findings confirm the existence of a difference in the motor development of boys and girls with visual impairment, in favor of male children (Fotiadou et al., 2014).

CONCLUSION

Based on the results of the study, we can say that subjects with visual impairment are late in motor development compared to their peers of typical development. Subjects with visual impairments are below average and well below average for their age. Motor development depends on the presence or absence of disabilities, while on the other hand, the gender does not greatly affect motor development. In line with these results, we believe that programs for motor development should be structured primarily in relation to skills, namely to be profiled in relation to the type of disorder. As a limitation of the study, we present a relatively small sample of children with visual impairment, but also children of typical development. Some of the next surveys should include a larger sample, another age category, and grouping children with visual impairment in relation to the level of visual impairment.

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THE ROLE OF PERSONAL ASSISTANT IN YOUNG PEOPLE WITH DISABILITIES

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ABSTRACT

The aim of the paper is to examine the need for a personal assistant in young people with disabilities. The sample of respondents consisted of young people with disabilities, chronologically aged 18-35, both genders, 50 of them, selected by random selection method from the Tuzla Canton area. The data obtained by the research were processed using the method of parametric and nonparametric statistics. Frequencies, percentages and measures of central tendency are calculated (arithmetic mean, standard deviation). The results obtained showed that there is a need for a personal assistant for young people with disabilities.

Keywords: *young people with disabilities, personal assistant*

INTRODUCTION

From birth to the stage of becoming independent, every man has the desire to become independent in all aspects of life (Anić, 2002). A person with disabilities is like any person with a different physical or mental condition or a disease that permanently disables the meeting of personal and social needs in everyday social and economic life (Žunić, 2001). Activities of everyday life include tasks for which a person is regularly prepared or as an addition to participate in his or her social roles and work in everyday life (Trombly, 1995). Managing social interactions is one of the most complex tasks people do (Masty and Schwab, 2006). An individual is one who does not depend on others

or does not want to depend on others, which does not mean that he/she does not need or does not want them (Husić-Đuzić, 2016). According to prudence about him/herself, the person sets the expectations of him/herself (King et al., 1993). These expectations can be real, but they can be lower or higher than what can really be achieved in a situation (Seligman, 2007). Self-esteem in people with disabilities is defined by the assessment of their own capacities for functioning in the social environment (Omolayo, 2009). The philosophy of independent living is the result of advocating the movement of persons with disabilities to regard the issue of disability as a matter of human rights, and not pity and exclusively social protection (Vučenović & Mastikosi, 2011).

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The personal assistant implies that the support of an assistant is aimed at meeting the needs of only one particular person with disabilities. This ensures the highest quality service, because it is provided according to the specific and individual needs of each user (Dinkić & Momčilović, 2005). The model of long-term person-oriented services for people with disabilities includes the following elements: rights and responsibilities of service users, individualized planning of services according to user needs, user choice, training and supervision of service providers, limited supervision by medical workers, flexible benefits - which include personal assistance, auxiliaries, environmental adjustments, user education, friends / allies, individualized funding of services through cash payments to users or authorizing users to pay for services through an agency or fiscal intermediary and monitoring service quality (Powers, 2003). A survey conducted by Rajkov and Ljubinković (2001) shows that people with disabilities mostly need support in movement and transportation, support related to the procurement of household work, support for social contacts, support for maintaining personal hygiene, assistance in education, support for performing professional duties, nutrition support (Rajkov & Ljubinković, 2001).

AIM OF THE PAPER

The aim of the paper is to examine the need for personal assistants in young people with disabilities.

METHODS

Sample respondents

The sample of respondents consisted of two sub-samples. The first sub-sample consisted of young people with disabilities, chronologically aged 18–35, both genders, 50 of them. The second sub-sample consisted of young people without disabilities, chronologically aged 18–35, both genders, 50 of them, selected by random selection method from the Tuzla Canton area.

Method of conducting research

The research was conducted over a period of two months during which field testing was carried out. Each respondent answered independently after previously having received instructions from the inter-

viewers. Respondents were asked to express their agreement or disagreement, or the degree of agreement or disagreement with the views expressed in the assertions. Young people with disabilities are interviewed individually. The time that was scheduled for the interview with each respondent is 15–25 minutes. Young people without disabilities are interviewed in groups. The time required to complete the questionnaires provided by this study is 15 minutes. All respondents were familiar with the research goal and were informed about how to complete the questionnaire.

Measuring instruments

For the purposes of this research, the Questionnaire was used to examine the needs for a personal assistant (Bratovčić & Mehmedinović, 2015) containing 10 assertions, and examining the following problem areas: Would you be satisfied with the fact that you have a personal assistant?, How much would a personal assistant contribute to your independence? , How much would a personal assistant make it easier for you to participate in daily life activities?, Would you feel less useful or worthy to have a personal assistant?, Does your family act overprotective towards you?, How much would the presence of a personal assistant allow you to do the job activities that were previously unavailable to you?, How important would it be for you a personal assistant to be of the same gender as you?, Would the presence of a personal assistant interfere in personal contacts?, If you had the financial ability, would you pay personal assistance services yourself ?, Do you think that financial assistance for the work of a personal assistant is exclusively a duty of the state? The respondents' task is to evaluate the degree of agreement on the scale from 1 to 5 with assertions related to their need for a personal assistant, 1 means that it is very bad and 5 means that it is very good.

Data processing methods

The data obtained by the research were processed using the method of parametric and non-parametric statistics. Frequencies, percentages and measures of central tendency are calculated (arithmetic mean, standard deviation). The data is shown in the table. The data was processed in the statistical package SPSS 16 for Windows.

RESULTS

Table 1 shows the data related to the age of the respondents, where we can see that in the sample of young per-

sons with disabilities, 31 of the respondents are aged 18–25 and 19 are aged between 26–35 years. In the group of persons without disabilities, 25 respondents were aged between 18 and 25 and 25 were aged between 26–35.

Table 1. The structure of the respondents by age

Age	People without disabilities		Disabled people	
	f	%	f	%
18-25	25	50.00	31	62.00
26-35	25	50.00	19	38.00
Total	50	100.00	50	100.00

According to the results shown in Table 2, it can be seen that women in the group of persons without disabilities represent 82% of the respondents, while

the group of persons with disabilities is approximately equal in gender: 52% male and 48% female respondents.

Table 2. The structure of respondents by gender

Respondents	Male		Female		Total	
	f	%	f	%	f	%
People without disabilities	9	18.00	41	82.00	50	100.00
Disabled people	26	52.00	24	48.00	50	100.00

Based on the results from Table 3 it can be seen that in the sample of persons with disabilities the most represented persons are the ones with cerebral palsy (40%),

then multiple sclerosis (24%), spinal column injuries (16%), muscle dystrophy (10%), multiple disorders (4%), amputations (4%) and visual impairment (2%).

Table 3. The structure of respondents by type of disability

Type of invalidity	f	%
Multiple sclerosis	12	24.00
Cerebral paralysis	20	40.00
Muscular dystrophy	5	10.00
Amputations	2	4.00
Visual impairment	1	2.00
Spinal cord injury	8	16.00
Multiple disturbances	2	4.00
Total	50	100.00

According to the results shown in Table 4, it can be seen that in the group of persons without disabilities, the highest percentage of respondents are with a high professional education (76%), while in

the group of persons with disabilities the highest number of respondents are with completed secondary school in the regular curriculum (72%).

Table 4. The structure of respondents by the degree of professional education

Respondents	PROFESSIONAL EDUCATION											
	Elementary School		High school education		High school education - special program		College education		High qualification		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
People without disabilities	0	.00	11	22.00	0	.00	1.00	2.00	38	76.00	50	100.00
Disabled people	1	2.00	36	72.00	4	8.00	3.00	6.00	6	12.00	50	100.00

The results of the assessment of the need for a personal assistant for young people with disabilities are shown in Table 5.

Table 5. Perception of the need for a personal assistant for young people with disabilities

Ordinal number	QUESTIONS	The total or partial disagreement		The total or sufficient agreement	
		f	%	f	%
1.	Would you be satisfied with the fact that you have a personal assistant ?	7	14.00	43	86.00
2.	How much would a personal assistant contribute to your independence?	8	16.00	42	84.00
3.	How much would a personal assistant make it easier for you to participate in daily life activities?	10	20.00	40	80.00
4.	Would you feel less useful or worthy to have a personal assistant?	42	84.00	8	16.00
5.	Does your family act overprotective towards you?	33	66.00	17	34.00
6.	How much would the presence of a personal assistant allow you to do the job activities that were previously unavailable to you?	21	42.00	29	58.00
7.	How important would it be for you a personal assistant to be of the same gender as you?	48	96.00	2	4.00
8.	Would the presence of a personal assistant interfere in personal contacts?	45	90.00	5	10.00
9.	If you had the financial ability, would you pay personal assistance services yourself?	45	90.00	5	10.00
10.	Do you think that financial assistance for the work of a personal assistant is exclusively a duty of the state?	3	6.00	47	94.00

By looking at the results shown in Table 1, it can be seen that most young people with disabilities want to have a personal assistant (86%); (84%) also think that a personal assistant would contribute to their independence, and 80% of the respondents feel that the personal assistants would facilitate their participation in the activities of everyday life. Also, most respondents, about (94%) of them think that financial assistance for the work of a personal assistant should be exclusively within the competence of the state. How-

ever, more than half of the respondents (58%) think that the presence of a personal assistant would enable them to deal with activities that were previously unavailable to them. Most young people with disabilities (84%) would not feel less useful or worthy to have a personal assistant, while (96%) of the respondents do not care if their personal assistant is of the same gender as themselves, and (90%) of the respondents consider that the presence of a personal assistant would not interfere with personal contacts.

DISCUSSION

Support received by young people with disabilities from friends and parents can be one of the drivers of a successful and independent way of life. The desire to be independent and lack support from the immediate family and the people surrounding them is a barrier that young people with disabilities can face (Husić-Đuzić, 2016). Although the development of technology and access to the Internet enables and facilitates communication between people and the creation of wider social networks, however, social life on the Internet cannot meet the needs of the person for support and social belonging either in quantitative or qualitative terms (Rakić-Bajić & Hedrih, 2012). Research conducted by Bratovčić and Mehmedinović (2015) suggests that young people with disabilities have fewer opportunities to develop social relationships, networks and social interaction with their peers because they do social interaction indirectly through parents, family members and, in particular, the Internet. Social support does not always have to mean positive experience, especially in the context of independence (Karačić, 2012). Accepting help from other people can create a sense of addiction or inferiority in some, and these are cases where social support can be harmful because it does not allow recipients of social support to develop their own resources to handle stressful situations (Arsenović & Pantelić, 2014).

Bratovčić and Mehmedinović (2015), in a survey conducted with young people and their families, have come to the conclusion that most of the young people with disabilities and their parents considered that they need a personal assistant. If they were able, a high percentage of young people (80%) and their parents (70.5%) would pay for the services of a personal assistant. Also, (87.5%) of young people and (100%) of their parents consider that financial assistance for a personal assistant should be exclusively the obligation of the state. However, parents of young people with disabilities identify with a personal assistant and feel that they are doing the best work, and for them a personal assistant is someone who could replace them when they no longer exist. The results of this research indicate that young people with disabilities and their parents are not familiar with the role of personal assistant or the real benefits of personal assistance service for the independence of persons with disabilities. The results point to the need to undertake actions aimed at strengthening the capacity of young people with dis-

abilities and their families in terms of education and information on the rights of persons with disabilities and the strengthening of the personal and social skills necessary to fight for their rights. According to a survey related to the support of other people in carrying out activities of daily life, the results showed that, out of the total number of respondents, (92.2%) answered the question that relates to the support of others in carrying out activities of daily life. More than half of these people believe that they do not need any support from other people in performing these activities (63.3%). Among respondents who stated that they need support in daily life activities, they mostly refer to performing administrative work, leaving the place of residence, doing housework, moving and transport (Ljubinković, 2009). The results of the survey show that people with disabilities often need the following types of support: support in movement and transportation, support related to the procurement of household work, support for social contacts, support for maintaining personal hygiene, assistance in education, support for performing professional duties, nutrition support (Rajkov & Ljubinković, 2001).

CONCLUSION

Based on the obtained results of the research itself, the following conclusions can be made:

- most young people with disabilities want to have a personal assistant,
- they believe that a personal assistant would contribute to their independence in the activities of everyday life,
- financial assistance for the work of a personal assistant should be exclusively the obligation of the state,
- the presence of a personal assistant would allow them to deal with activities that were previously unavailable to them.

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SOCIAL SKILLS DEVELOPMENT OF ELEMENTARY SCHOOL STUDENTS IN RELATION TO THE EDUCATIONAL LEVEL OF THEIR PARENTS

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ABSTRACT

Social skills are one of the fundamental factors that determine the quality of relationships that an individual realizes with people in his or her environment. In the interpersonal relationship, many human needs are realized, and the learning of the skills that enrich interpersonal relationships starts from the earliest days of the child's life. The paper presents the results of the research aimed at examining the social skills of elementary school pupils in relation to the educational level of their parents. The survey was carried out on the sample of elementary school students from the city of Tuzla (N = 506). As the research tool, Inventory of Social Skills (Riggio and Throckmorton) and the Questionnaire of Socio-status Characteristics were used. The social skills of the respondents were analyzed separately in relation to the educational level of the mother and father, and the results obtained point to the conclusion that there is no statistically significant difference between the social skills of elementary school students in view of the educational level of their mothers, while the differences are present in relation to the educational level of the father; that is, elementary school pupils whose fathers are of lower educational level show a higher level of development of emotional control, social sensitivity and social manipulation.

Keywords: *social skills, parenting, verbal social skills, non-verbal social skills.*

INTRODUCTION

By nature, man is directed to other people and most needs and potential can be achieved through social interaction. However, the success of each individual in this context is determined by his social skills, which in the most significant sense imply success in establishing and maintaining positive interpersonal relationships.

Children who have developed social skills simply work outside the family environment in which they

are mostly inclined. These children are successful in achieving contacts and establishing friendships with peers. Also, when they go to school, they are successfully affiliated in the classroom (Urdan & Maehr, 1995, according to Mapiasse, 2007) and have a positive attitude towards the school (Denham, et al., 2003). In their research, Segrini Taylor (2007) found that the development of social skills is strongly linked to positive relationships with others, quality of life and optimism, while Spasenović (2009) found social adherence as a significant predictor of school success.

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Exploring the reasons why some scientists are unsuccessful at work, even though intelligence and non-education do not lag behind colleagues, Alan Frehman (according to Shapiro, 1997) pointed to the importance of social skills in this context, finding that individuals lack isolation and social skills isolate themselves and therefore their performance at work is weaker.

In the first years of the child's life, the learning of social skills is most strongly contributed by the family's conservative atmosphere, which is characterized by emotional warmth and respect for the child's needs from one hand, and the setting of demands and borders before the child, on the other. In this environment, they have the basic skills necessary for functioning in the game, and later with the expansion of the network of social relationships, which is accompanied and promoted by the child's cognitive development, the repertoire of social skills in his behavior is expanding.

Parental contribution to the development of social skills in children is realized directly in a way that social competence is demonstrated by its own example, and indirectly, which implies providing specific, explicit instructions on how a child should behave. Covey (1998) points out that providing modeling is the most important form of influence parents have on a child, because what they see in parents' behavior far more leaves a mark on children than a voice instruction.

Klarin (2002) conducted a survey on a sample of 263 children aged 10 to 14 in Zagreb, in order to examine the relationship between the quality of family interactions and child's peer relationships. The results that have been reported indicate that children with parental involvement, an open relationship, a relationship of trust and understanding, make that relationship with their best friend, and that the care and support that parents provide to the child stimulates the behavioral mechanisms that are desirable in relationship with a friend. Children who are accepted by parents have a positive image of themselves and are less rejected by their peers. When it comes to parental influence on the child in general, and so in the context of learning social skills, it is necessary to take into account the specificity of parenting of mother and father and treat them accordingly. In order to emphasize the importance of the father's educational role, which, unlike maternal much less explored and often reduced to foster care only, today it is increasingly tending to the other extreme, which is to identify the educational role of the father with the mother's. Bergmann (2007, p. 81) states that paternity is increasingly viewed "as an auxiliary service for the mother" or as "a complement to motherhood, but not as something in principle different". However, taking

into account the differences in their biological predisposition, it should be emphasized that the father and mother since the first days of the child's life contribute to its development in various ways, and therefore, as Sigman (2011, p. 84) points out, "the unique and necessary contribution of men and women as a parent should be praised, not disputed. "The mothers are those who promote safety and help the child to develop empathy and relate their behavior emotionally to the influence on others, while the fathers examine the boundaries and from them children learn more about how to cope in society and associate their behavior with the consequences (Sigman, 2011). The mother plays the role of patron, and the child often seeks maternal support and protection, while preferring to play with the father (Klarin, 2006).

In the set of factors that determine successful parenting, there is also the educational level of parents. When it comes to research concerning the role of the educational level of parents in relation to the social skills and competences of their children, they are mainly oriented towards the educational role of the mother, and the results support the thesis that children of mothers with a higher level of education have a higher level of development of social skills. Thus, Sindik and Lukačić (2012), examining the social competences of pre-school children, in terms of gender, the educational level of the mother and the number of brothers and sisters, concluded that socially more competent children are the ones with mothers with higher education, while Brajša - Žganec (2003) found that children of pre-school age whose mothers have a higher level of education manifest less aggressive behavior in the kindergarten environment.

METHODS

The aim of the research is to examine the social skills of elementary school students, considering the educational level of their parents. In line with the aim, a research hypothesis was also set up, which assumes that there is a statistically significant difference between the results achieved by the elementary school pupils on the Inventory of Social Skills and in relation to the educational level of their parents. *A sample of the research* was made up of 506 students from six elementary schools from the city of Tuzla. The selection of schools where the research was conducted was made using the Spss quasi-random number generator. In the same way, the class collectives in which the survey was conducted, i.e., sample survey is random. Having in mind the gender of the respondents, the structure of the sample consisted of 225 girls and 281 boys.

The age of the respondents ranges from 11 to 14 years, i.e., the sample included 110 students of the fifth, 129 students of the sixth, 122 students of the seventh and 145 students of the eighth grade.

To measure social skills, the *Inventory of Social Skills - ISS* (Riggio and Throckmorton, 1986) was used, while for the purpose of obtaining data on the educational level of the parents of the respondents, the *Questionnaire of socio-status characteristics* was applied. The modified version of the Inventory of Social Skills, used for the purposes of this paper, consists of 28 items classified into seven subscales, namely two domains of the Inventory: emotional-non-verbal and social-verbal. The emotional-non-verbal domain of the Inventory consists of three subscales: Emotional expression, Emotional sensitivity and Emotional control, while the social-verbal domain of the Inventory is composed of four subscales: Social expression, Social sensitivity, Social control and Social manipulation. Each subscale consists of 4 particles represented in the form of a Likert type scale with response modes from 0 to 8 (0 = complete disagreement, 8 = total agreement).

The subscale Emotional expression reflects the skill of expressing emotions in a non-verbal way. Subscale Emotional sensitivity is a measure of the skill of decoding non-verbal messages, while Subscale of Emo-

tional control measures the ability to control their own emotions. Together, these three skills constitute an index of general emotional / non-verbal competence.

Subscales of the social-verbal domain of the Inventory reflect the verbal communication skills, whereby the Subscale of Social sensitivity is a measure of decoding and understanding of verbal communication, the Subscale of Social expression is a measure of veil expression and the ability to involve others in social interaction, while the Subscale of Social control refers to measuring the self-representing and playing skills role. Subscale Social manipulation is a measure of manipulation in communication with other people.

RESULTS

Social skills of elementary school students with regard to the educational level of the mother

Indicators that reflect the results of the respondents on the Inventory of Social Skills, with regard to the educational level of the mother, were analyzed individually for the Emotional-Non-verbal and Social-Verbal Area of the Inventory, and presented in the tables as follows.

Table 1. Descriptive indicators of the results of the respondents on the scales of the Emotional non-verbal area of the ISS in relation to the educational level of the mother

		N	M	SD	Std. Error	Min.	Max.
Emotional expression	ES	77	17.80	5.63	.64	.00	28.00
	HSE	247	17.19	5.52	.35	5.00	32.00
	AC	82	17.55	6.66	.73	6.00	32.00
	UD	100	17.44	6.17	.61	3.00	31.00
	Total	506	17.39	5.85	.26	.00	32.00
Emotional sensitivity	ES	77	21.06	7.34	.84	1.00	32.00
	HSE	247	21.43	6.34	.40	3.00	32.00
	AC	82	20.72	6.15	.68	8.00	32.00
	UD	100	19.75	7.71	.77	.00	32.00
	Total	506	20.93	6.77	.30	.00	32.00
Emotional control	ES	77	19.48	6.99	.79	2.00	32.00
	HSE	246	18.16	6.61	.42	1.00	32.00
	AC	82	17.45	6.85	.76	.00	32.00
	UD	100	16.72	7.35	.73	.00	32.00
	Total	505	17.96	6.89	.31	.00	32.00

ES=Elementary school education; HSE=High school education; AC=Academy; UD=University degree

For the purpose of checking the homogeneity of the subgroup variant, the Leven test procedure was applied, which indicates that the variances are uniform

and there are no statistically significant differences, so Variance Analysis was applied to determine the differences between groups.

Table 2. Variation analysis for the Emotional-non-verbal area of the Inventory, in relation to the variable "educational level of the mother"

		Sum of the square	df	Middle square	F	p
Emotional expression	Between the groups	25.04	3	8.35	.24	.87
	Within the group	17289.69	502	34.44		
	Total	17314.74	505			
Emotional sensitivity	Between the groups	205.81	3	68.60	1.50	.21
	Within the group	22928.48	502	45.67		
	Total	23134.29	505			
Emotional control	Between the groups	363.10	3	121.03	2.57	.05
	Within the group	23585.18	501	47.07		
	Total	23948.28	504			

In Table 2 it is evident that there is no statistically significant difference in the results achieved by elementary school students in scales from the

Emotional-non-verbal Area of the Inventory, and in relation to the educational level of the mother ($p > .05$).

Table 3. Descriptive indicators of respondents' results on the scales of the Socio-verbal area of the Inventory, in relation to the educational level of the mother

		N	M	SD	Std. Error M	Min.	Max.
Social expression	ES	77	19.51	5.58	.64	4.00	30.00
	HSE	247	19.31	5.87	.37	0.00	32.00
	AC	82	18.99	5.41	.60	8.00	32.00
	UD	100	18.87	5.87	.59	6.00	31.00
	Total	506	19.20	5.74	.25	.00	32.00
Social sensitivity	ES	77	22.57	6.22	.71	7.00	32.00
	HSE	247	22.07	5.39	.34	6.00	32.00
	AC	82	20.46	5.07	.56	5.00	30.00
	UD	100	21.16	6.14	.61	5.00	32.00
	Total	506	21.70	5.65	.25	5.00	32.00
Social control	ES	77	19.26	5.88	.67	1.00	32.00
	HSE	247	18.60	5.47	.35	3.00	32.00
	AC	82	18.83	5.44	.60	3.00	30.00
	UD	100	17.48	6.47	.65	3.00	32.00
	Total	506	18.52	5.75	.25	1.00	32.00
Social manipulation	ES	77	18.61	5.56	.63	6.00	29.00
	HSE	247	18.60	5.22	.33	3.00	32.00
	AC	82	19.07	5.89	.65	3.00	32.00
	UD	100	20.16	5.94	.59	3.00	32.00
	Total	506	18.99	5.54	.25	3.00	32.00

Using the Leven test, a variance homogeneity test was performed, which found that the variance was uniform and that there were no statistically significant differences, which allowed the application of

the Variance Analysis to determine the difference between the results obtained by respondents on the Scales of the Socio-verbal area of the Inventory (Table 4).

Table 4. Variance analysis for the subscales of the Social-verbal area of the Inventory in relation to the variable „educational level of the mother“

		Sum of the square	df	Middle square	F	p
Social expression	Between the groups	25.12	3	8.37	.25	.86
	Within the group	16636.91	502	33.14		
	Total	16662.03	505			
Social sensitivity	Between the groups	246.60	3	82.20	2.59	.05
	Within the group	15926.51	502	31.73		
	Total	16173.12	505			
Social control	Between the groups	159.85	3	53.28	1.61	.18
	Within the group	16540.49	502	32.95		
	Total	16700.34	505			
Social manipulation	Between the groups	185.50	3	61.83	2.02	.11
	Within the group	15344.43	502	30.56		
	Total	15529.93	505			

By looking at the presented statistical indicators it is evident that there is no statistically significant difference between the results achieved on the scales from the Social-Verbal area by elementary school students whose mothers have different educational levels ($p > .05$).

The statistical procedure applied to the analysis of indicators that reflect the results of the respondents on the Inventory of Social Skills, given the educational level of the mother, was also applied in the analysis of these results of the respondents relative to the educational level of the father (Table 5).

Social skills of elementary school students in relation to the educational level of the father

Table 5. Descriptive indicators of respondents' results on the Inventory of Social Skills in relation to the educational level of the father

		N	M	SD	Std. Error M	Min.	Max.
Emotional expression	ES	41	17.93	5.63	0.88	4.00	32.00
	HSE	264	17.33	5.80	0.36	0.00	30.00
	AC	87	17.39	6.72	0.72	3.00	32.00
	UD	114	17.34	5.40	0.51	3.00	29.00
	Total	506	17.39	5.85	0.26	0.00	32.00
Emotional sensitivity	ES	41	22.46	6.46	1.00	8.00	32.00
	HSE	264	21.42	6.61	0.41	1.00	32.00
	AC	87	19.96	6.60	0.71	8.00	32.00
	UD	114	19.97	7.20	0.67	0.00	32.00
	Total	506	20.93	6.77	0.30	0.00	32.00
Emotional control	ES	41	20.07	6.29	0.98	6.00	32.00
	HSE	263	18.30	6.66	0.41	1.00	32.00
	AC	87	17.57	7.35	0.78	1.00	32.00
	UD	114	16.72	7.10	0.66	0.00	32.00
	Total	505	17.96	6.89	0.30	0.00	32.00
Social expression	ES	41	19.36	5.97	0.93	4.00	30.00
	HSE	264	19.55	5.88	0.36	0.00	32.00
	AC	87	18.65	5.29	0.56	6.00	32.00
	UD	114	18.76	5.67	0.53	7.00	31.00
	Total	506	19.20	5.74	0.25	0.00	32.00
Social sensitivity	ES	41	24.43	5.03	0.79	12.00	32.00
	HSE	264	21.83	5.60	0.34	6.00	32.00
	AC	87	20.42	5.49	0.59	5.00	31.00
	UD	114	21.41	5.83	0.55	5.00	32.00
	Total	506	21.70	5.66	0.25	5.00	32.00

Continuation of table 5.

		N	M	SD	Std. Error M	Min.	Max.
Social control	ES	41	19.56	5.54	0.86	5.00	28.00
	HSE	264	18.94	5.90	0.36	1.00	32.00
	AC	87	18.16	5.05	0.54	3.00	31.00
	UD	114	17.43	5.85	0.55	3.00	32.00
	Total	506	18.52	5.75	0.25	1.00	32.00
Social manipulation	ES	41	19.95	5.43	0.85	6.00	32.00
	HSE	264	18.32	5.35	0.33	3.00	32.00
	AC	87	19.61	5.90	0.63	3.00	32.00
	UD	114	19.72	5.62	0.53	3.00	32.00
	Total	506	18.98	5.54	0.25	3.00	32.00

In order to verify the homogeneity of the subgroup variance, the method of the Leven test, whose results point to the uniformity of the variance, was used, and in order to verify the difference between the results obtained by

respondents on the Inventory of Social Skills and in relation to the Educational level of the father, the Variance analysis was applied (Table 6).

Table 6. Single-factor analysis of variance for subscales of the Inventory of social skills in relation to the educational level of the father

		Sum of the square	df	Middle square	F	p
Emotional expression	Between the groups	12.92	3	4.30	0.12	.94
	Within the group	17301.82	502	34.47		
	Total	17314.74	505			
Emotional sensitivity	Between the groups	344.11	3	114.70	2.52	.05
	Within the group	22790.18	502	45.40		
	Total	23134.29	505			
Emotional control	Between the groups	401.95	3	133.98	2.85	.03
	Within the group	23546.33	501	46.99		
	Total	23948.28	504			
Social expression	Between the groups	80.90	3	26.97	.82	.48
	Within the group	16581.13	502	33.03		
	Total	16662.03	505			
Social sensitivity	Between the groups	462.81	3	154.27	4.93	.00
	Within the group	15710.31	502	31.29		
	Total	16173.12	505			
Social control	Between the groups	238.41	3	79.47	2.42	.06
	Within the group	16461.93	502	32.79		
	Total	16700.34	505			
Social manipulation	Between the groups	251.02	3	83.67	2.75	.04
	Within the group	15278.90	502	30.44		
	Total	15529.93	505			

According to the results presented in Table 6, there is a statistically significant difference on the Scale of Emotional Control and the Scale of Social Manipulation ($p < .05$), as well as the Scale of Social Sensitivity

($F = 4.93$, $p < .01$). The direction of these differences was determined by applying the Post Hoc Comparison procedure (Table 7).

Table 7. Significance of differences between the results of the respondents on the scales Emotional Control, Social Sensitivity and Social Manipulation, and in relation to the educational level of the father

	(I) The educational level of father	(J) The educational level of father	The difference between M (I-J)	Std. Error	p
Emotional control		HSE	1.77	1.15	.12
	ES	AC	2.50	1.30	.05
		UD	3.35	1.25	.00
	HSE	AC	.72	.85	.39
		UD	1.58	.77	.04
	AC	UD	.85	.97	.38
Social sensitivity		HSE	2.61	.94	.00
	ES	AC	4.01	1.05	.00
		UD	3.02	1.01	.00
	HSE	AC	1.40	.69	.04
		UD	.42	.63	.50
	AC	UD	-.98	.80	.22
Social manipulation		HSE	1.63	.92	.08
	ES	AC	.34	1.04	.74
		UD	.23	1.00	.82
	HSE	AC	-1.29	.68	.06
		UD	-1.40	.62	.02
	AC	UD	-.11	.78	.89

According to the data from Table 7, statistically significant difference was observed between the results achieved by children whose fathers have completed only elementary school, compared to those whose fathers have a university degree ($p < .01$). At the same time, pupils whose fathers have only elementary education show higher results. This is also the case with the results of the Social Sensitivity Scale, whereby the results of children whose fathers have elementary school completion are statistically significantly different in relation to children whose fathers have high school, academy and university qualifications ($p < .01$). The results of children whose fathers have completed high school education are statistically significantly different on the Scale of Emotional Control ($p < .05$) and the Scale of Social Manipulation ($p < .05$) compared to the results of pupils whose fathers have academy qualifications, while the results of these students on the Scale of Social sensitivity significantly differ in relation to the results of pupils whose fathers have academy education ($p < .05$).

DISCUSSION

In the process of learning social skills in children, the roles of parents are of primary importance. Intense

social changes, which are inherent in the time we live in, and which reflect on the family's educational function, increasingly complicate the role of parents, and it is necessary to empower parents' pedagogical competences.

In order to examine how the educational level of parents reflects on the process of learning and development of social skills in children, we have focused our attention on examining differences in the development of social skills of elementary school pupils, bearing in mind the educational level of their parents. Obtaining an insight into such indicators is one of the fundamental guidelines for understanding the phenomena of learning social skills in a family context, primarily having regard to the educational level of parents in this regard, as well as for identifying parents whose pedagogical perspective needs to be empowered to contribute and stimulate the development of socio-emotional skills of their children. Also, an understanding of social skills learning in different family settings, which is, *inter alia*, conditioned by the level of parent education is one of the indicators with which the pupils, having in mind the family educational environment from which they come, need additional educational work at school, in order to improve their socio-emotional development.

The results we have come to suggest that there is no statistically significant difference in the development of social skills in elementary school children, when the variables of the mother's educational level are taken into account. As a basis for explaining this result, some findings can be found (Brown & Sar, 1993; Kurdek & Fine, 1994; Windle, 1992; Deković & Raboteg-Šarić, 1997) that indicate that adolescents with close emotional ties with parents exhibit a higher level of social competence, self-esteem and responsibility, where they primarily satisfy the emotional, inner needs of the mother (Petrović & Mihić, 2009). It is well known that mothers unconditionally provide love and support to their children and, thanks to the inherent natural feeling of upbringing, form a strong emotional connection with them and thus a space for greater influence, and probably contribute to the socio-emotional development of their children, while the educational level of the mothers, in this context, is not of primary importance. However, if we consider school as a place of "living and gaining experience", a higher educational level of mothers should imply a higher level of pedagogical culture, that is, to contribute to the improvement of their educational role in general, and also to that part of the greater possibility influences on the development of their children's social skills. Naturally, parenting is also to be seen from the perspective of the wider social context, which is shaped by a multitude of influences, and in that respect it is necessary to consider the time factor that mothers of higher education, especially those employed, spend with their children and dedication to joint activities is a "space" for learning social skills.

Contrary to our results, the researches mentioned earlier in this paper (Brajša-Žganec, 2003 and Sindik & Lulačić, 2012) point to a different contribution of the mothers' educational level to the development of their children's social competences, i.e. pre-school children whose mothers have a higher educational level show a higher level of social competences. The reason for these differences between these and the results of our research can be related to the age of respondents, given that the network of social relationships with age is widening, so adolescents, besides parenting, are exposed to intertwined influence of teachers, peers, media while children of preschool age are exposed to a small number of influences, and dominant is parenting, which is more clearly reflected in the field of social skills and competences. Also, a preschool period in which a child is unable to meet a number of elementary needs independently implies greater involvement

of parents in the child's daily activities and caring for them.

The results we have come to include the social skills of elementary school pupils with regard to the educational level of the father point to the existence of statistically significant differences in the results of the respondents on certain subscales of the Inventory, with the difference in direction being such that pupils whose fathers are of the lower educational level show significantly better results in the Scale of Emotional Control, Social Sensitivity and Social Manipulation, compared to the children whose fathers have higher education. Examining the relationship between interpersonal values and social status, Majstorović (1998) has come up with similar results, i.e. lower status parents present an environment conducive to the development of the child's orientation towards the group, while better living conditions and higher family status stimulate the development of personal independence. This phenomenon is interpreted in a way that children whose parents are of lower social status are more prone to investing in warmth, understanding, and helping the group to get the same in return. Since it is not rare in our society to treat lower education families as inferior, it is possible for these reasons that pupils whose fathers are of the lower educational level show more developed skills such as emotional control, social sensitivity and social manipulation, compared to children whose fathers have higher educational qualifications. In the literature, while emphasizing the educational role of the father, in addition to education, the emphasis is placed on involvement in children's activities. According to the results of the research Wherry (2003, according to Sremic & Rijavac, 2010) aimed at examining the influence of parental involvement on students' school success, students whose parents participate in their activities more easily overcome their obligations, have better developed social skills, prefer to attend classes and are well adapted to the school environment. Stevenson and Baker (1987, according to Sremic & Rijovic, 2010) noted the positive correlation between parent involvement in child activities. All of this points to a possible explanation of our results and in a way that more educated fathers are oriented to their own activities and obligations, and therefore are less involved in everyday activities of children and spend little time with them, unlike fathers who have lower educational status, who possibly through their commitment, closeness and involvement in everyday child activities contribute to their socio-emotional development.

CONCLUSIONS

Social skills are one of the fundamental factors for the successful functioning of an individual in different social contexts, and in the process of their learning the role of parents is of primary importance. The influence on the development of social skills in children is realized directly and indirectly by the parents, where this influence is determined by numerous factors, such as: development of the social skills of the parents themselves, involvement of parents in children's activities, quality of interaction between parents and child, socio-economic status, etc.

In order to study the social skills of elementary school pupils and in relation to the educational level of their parents, in this paper we have come to the conclusion that there is no statistically significant difference between the social skills of elementary school students, given the educational level of the mother, while the social skills of elementary school students statistically differ significantly in relation to the educational level of the father, in the way that elementary school students, whose fathers are of lower educational level, show greater development of emotional control, social sensitivity and social manipulation.

Such results indicate the need to strengthen the pedagogical culture of the parents, regardless of their educational level.

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PROSOCIAL BEHAVIOR FROM THE ASPECT OF THE STRUCTURE OF LEISURE TIME

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ABSTRACT

The aim of the research is to determine the characteristics of the prosocial behavior of primary and high school students in terms of the structure of leisure time. The sample of respondents consists of 230 students of the final grades of primary and high schools, both genders, aged 14-19. The research was conducted in the area of Tuzla during the school year 2017/2018. years. The survey used the measuring instrument "Scale of self-assessment of juvenility behavior YSR". Mann Whitney U test was used for statistical analysis of data. When analyzing the prosocial behavior of primary and high school students in terms of the structure of leisure time, statistically significant differences at the level of $p \leq 0,05$ were established in such a way that students with structured leisure time compared to students whose leisure time is not structured more often : are fairly honest, they do things better than most children, they can be pretty friendly, they are skillful with their hands, they fight for their rights, enjoy being with other people, they like to make others laugh, they like to help others.

Keywords: *leisure time, children and juvenility, prosocial behavior*

INTRODUCTION

The issue of choosing the content that young people fulfill their leisure time with is one of the keys to assessing the quality of their everyday life, but also to understand their needs, as well as the potential to evolve in the future, with the remark that leisure time is often associated with risky behaviors (Žiga et al., 2015). According to Badrić and associates (2011), in order to ensure that children's leisure time is well organized, the question of the structure of the time in one day should be posed, with a view to the fact that

in everyday life the simplest division of the notion of time, working time or time, which is called the "non-free time", as well as for leisure or time remaining to the individual available after completing his duties. In pedagogical literature, the term "leisure time" denotes "the time that an individual fills and shapes according to his own desires, without any obligation and necessity". It is a part of the life of every person who exists every day and in every environment, but is different in view of the age, gender, interest, place of residence, development of the environment, degree of interest, goals of the social order and its possibilities.

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Leisure is an integral part of man's activity, a time beyond professional, family and social obligations, in which an individual chooses, at his will, the forms and contents of rest, recreation and creativity "(Pedagogical Encyclopedia II, 1989, 353). Already by its essential characteristics and conditions provided by leisure time, it enables the realization of the human need for self-activity, as well as its desire to freely choose the social environment, activity and the media of its expression, communication, knowledge, and, by changing the environment, the contents and means of expression, to try out its creative potential, its identity (Nola, 1990). In their leisure time, young people most often choose activities of a social nature, such as going out and socializing with friends, while far less interest they show for cultural and educational activities. (Fitzgerald et al, 1995; Ilishin, et al., 2001; Ilishin, 2002; Vrkić Dimić 2005, 2007, according to Pehlic, 2014). The fun of young people, according to Pehlic (2014), is to fulfill the time available to them after normal work, school obligations, and entertainment activities and activities require little or no engagement. Mlinarevic (2004) states that if an adolescent is connected with peers who have positive norms and values, he will accept them himself, and if they have deviant norms, there is (Oetting, Donnermeyer, 1998), a great chance that he will accept the same. Adolescents do not attach to a random group, they choose them by similarity or importance.

Prosocial behavior involves social behavior that is basically charity, helping others, meeting their needs or removing difficulties. In the broadest sense, prosocial behavior is defined as a willing intentional behavior that has positive consequences for other people. Prosocial behavior includes benevolence, kindness, material help and moral support, empathy and altruism (Eisenberg and Miller, 1987, according to Raboteg-Sarić, 1993). The motivational basis of prosocial behavior has been observed through many studies. On the basis of them, several models have been identified that interpret the connection between the situation conditions and the psychological processes that jointly condition the occurrence of prosocial behavior. Depending on which processes are given greater importance, normative, cognitive and emotional models are distinguished (Raboteg-Šarić, 1993).

Every activity in leisure time contains its developmental, self-activating and primary preventive role. If educational activity is achieved in leisure time, the results of upbringing for leisure time are achieved and leisure time activities become a necessity for self-actualization of the personality of young people, then leisure activities fulfill both of these roles.

Speaking about the importance of leisure time, Pehlic (2015) states the following: "Leisure time is a time in which individuals can live in harmony with their individual nature, in which they can affirm and further develop their own qualities. It is an important opportunity for rest, leisure, distraction from everyday worries and burdens and is an important factor in the "liberation" of young people. Unless efforts are made to make leisure time constructive, it can easily be destructive in the process of individual youth development. "The attitudes and behavior of young people in the adolescence period, according to Meskić - Blazević (2007), are strongly influenced by friends and peer groups, with the influence and pressure of the peer group stronger than the person is more precarious and more inclined to social conformation. The author also emphasizes that one of the most important risk factors for the emergence and development of behavioral disorders, namely socializing with persons of delinquent behavior, and in the environment of such persons, regular negative proofs and the struggle for hierarchical prestige lead to deeper social decline.

The aim of research and hypothesis

The aim of the research is to determine the characteristics of the prosocial behavior of primary and high school students in terms of the structure of leisure time. The paper assumes that students who have structured leisure time are more prosocially oriented.

METHODS

The sample of respondents consists of 230 pupils of the final grades of primary and high schools, both genders, aged 14-19. The research was conducted in the area of Tuzla.

Table 1. Structure of the sample of respondents from the aspect of gender and school age

Gender of respondents - pupils	School age of students - final grades				Total respondents	
	Primary school		High school		N	%
	N	%	N	%		
Male	32	13.9	52	22.6	84	36.5
Female	46	20.0	100	43.5	146	63.5
Total respondents	78	33.9	152	66.1	230	100.0

The sample of respondents includes students in the final grades of primary and high schools, and the structure consists of 78 (33.9%) students in the final grades of the primary school and 152 (66.1%) of students in the final grades of high school, while from the aspect of the gender of the respondents, the structure implies 84 (36.5%) male students and 146 (63.5%) female students in the final grades. During the research, a questionnaire was used that was specifically designed for the purposes of this research in the part relating to leisure time, and

for behavioral problems, the Scale of self-assessment of juvenility behavior YSR (Achenbach, Rescorla 2001) was used. The questionnaire was filled out by students independently, after receiving the instruction, and during class hours, at the prescribed time for completing it for 45 minutes. The statistical program SPSS 22.0 for the Microsoft Windows operating system was used for data processing. Statistical significance was appreciated for $p \leq .05$. The analysis used for this research is Mann Whitney U test.

RESULTS AND DISCUSSION

Table 2. Frequency of response to the question of satisfaction with the way of spending leisure time

Answer Options	Variable	
	Satisfaction with the way of spending leisure time	
Completely unsatisfied	N	9
	%	3.9
Unsatisfied	N	14
	%	6.1
Neither satisfied nor unsatisfied	N	101
	%	43.9
satisfied	N	73
	%	31.7
Completely satisfied	N	33
	%	14.3
Total respondents	N	230
	%	100.0

The student satisfaction with the way of spending leisure time is the following: 101 (43.9%) of students finishing primary and high school is neither satisfied nor unsatisfied, 73 (31.7%) of students are satisfied with the way of spending leisure time and 33 (14.3 %) of students express complete satisfaction, while 14 (6.1%) of students expressed complete satisfaction and 9 (3.9%) of students expressed complete dissatisfaction with the

way of spending leisure time.

Two surveys conducted in 2005 in Slavonia on a sample of 455 high school students and in 2006 in Zadar on a sample of 1000 high school students show that high school students in Slavonia are satisfied with the spending of leisure time (54.0%) compared to high school students in Zadar (44.0%) (Mlinarević et al., 2007).

Table 3. Frequency of the answer to the question about the decision on the way of spending leisure time

Answer Options	Variable	
	Decision on the way of spending leisure time	
Made the decision myself	N	179
	%	74.0
Made the decision with the help of family	N	30
	%	12.4
Made the decision with the help of school and teachers	N	16
	%	6.6
Made the decision with the help of a club or association of which I am a member	N	11
	%	4.5
Made the decision with the help of someone else	N	6
	%	2.5
Total answers	N	242
	%	100.0

The decision on the way of leisure time is given by the students of the final grades of primary and high school independently (alone), which is confirmed by 179 (74.0%) answers, followed by decisions made with the help of family - 30 (12.4%) answers, followed by 16 (6.6%) answers referring to the help of school and teachers, while 11 (4.5%) student responses are the help of a club or association whose members they are, 6 (2.5%) answers to the question about making a decision on how to spend leisure time is related to the help of someone else, where 5 (2.1%) responses refer to the help of friends, and 1 (.4%) answer refers to dependence on obligations and time.

According to Tomić and Hasanović (2007), a survey con-

ducted on a sample of 442 primary school students in Brčko, Žepče, Živinice, Kalesija and Gračanica shows that the majority of respondents, that is, 72.4% choose the activities in their leisure time independently, and from the socialization agents which direct them to the proper organization of leisure time, the family has the strongest influence on them, that is, the parents 15.8%.

The same authors also state that the results of the research on the sample of 640 high school students in our country show that most of the respondents (73.4%) spend leisure time freely and their own choice, and that the influence of the family (6.4%) and the school (5.6%) is insignificant on the spending of leisure time of high school students.

Table 4. Frequency of the answer to the question about the organization (structure) of leisure time

Answer Options	Variable	
	Organization (structure) of leisure time	
Yes	N	103
	%	44.8
No	N	127
	%	55.2
Total respondents	N	230
	%	100.0

The organization or structure of leisure time is present in 103 (44.8%) students in the final grades of primary and high schools, while 127 (55.2%) of students think that their leisure time is not organized.

Based on the results of the research carried out in 2000 in Croatia on a sample of 1000 students, aged

11 to 15, according to Ilishin (2013), a quarter of children are not occupied with any extracurricular activities. A survey conducted in 2004 in Pula, referring to 1397 primary school students, found that 68.1% of students were involved in some organized extracurricular activity (Marković, Arsić, 2005).

Table 5. The credit for creating leisure time activities for young people

The credit for creating leisure time activities for young people	Ranking by relevance - least important (rank 8) / most important
Every young person for itself	1
Parents	2
School	3
Friends	4
Youth associations	5
Representatives of the local community	6
Media	7
Someone else	8

Primary and high school students of final grades were tasked to rank the importance of taking credit for designing leisure activities of young people with the possibility of correspondence with someone in their opinion, and the results show that students are aware that they are primarily responsible for conducting their leisure time, so the option "every young person for itself" is ranked on the first place in the highest number, then, in their opinion, on the second position

of significance, there is the option "parents", on the third "school" and on the fourth position "friends". The remaining four positions relate to the options "youth associations", "representatives of the local community", the "media", and as an opportunity to correspond to another student, the following answers are given: brother / sister, relatives, neighbors, boyfriend / girlfriend, trainer, acquaintances, community members and someone older.

Table 6. Mann Whitney test for prosocial behavior from the aspect of leisure time structure

	Variables	Structure of leisure time				Mann	<i>p</i>
		Structure		No structure		Whitney	
		N	M Rank	N	M Rank	test	
PROSOCIAL BEHAVIOUR	I like animals.	103	117.06	127	114.23	6379.50	0.69
	I'm pretty honest.	103	129.52	127	104.13	5096.00	0.00
	Some things I do better than most children.	103	124.52	127	108.18	5611.00	0.04
	I can be pretty friendly.	103	133.51	127	100.89	4685.50	0.00
	I like to try out new things.	103	123.79	127	108.78	5686.50	0.05
	I'm skillful with my hands.	103	134.63	127	99.99	4570.50	0.00
	I fight for my rights.	103	136.95	127	98.11	4331.50	0.00
	I enjoy being with other people.	103	132.03	127	102.09	4837.50	0.00
	I like to make others laugh.	103	125.43	127	107.45	5518.00	0.02
	I like to help others.	103	130.78	127	103.11	4966.50	0.00
	I try to be fair to others.	103	121.03	127	111.01	5970.50	0.19
	I enjoy a good joke.	103	122.59	127	109.75	5810.50	0.04
	I like to enjoy life.	103	129.31	127	104.30	5118.00	0.00
	I try to help others when I can.	103	129.73	127	103.96	5074.50	0.00

When analyzing the prosocial behavior of primary and high school students of final grades in terms of the structure of leisure time, statistically significant differences at the level of $p \leq 0.05$ were established in such a way that students with structured leisure time performance compared to students whose leisure time is not structured more often :

- are pretty honest
- do some things better than most children
- can be pretty friendly
- are skillful with their hands
- fight for their rights
- enjoy being with other people
- like to make others laugh
- like to help others
- enjoy a good joke
- like to enjoy life and
- try to help others when they can.

The results of the research, according to Oetting and Donnermeyer (1998), show that a quality and structured implementation of leisure time prevents the appearance of behavioral disorders. The Youth Network of Croatia (Buković, 2010, according to Pehlić, 2014) conducted research on the problem, needs and social position of young people. Young people spend most of their leisure time in the private sphere, in the company of friends, watching television, staying online, listening to music. In the leisure time area, they are most affected by the lack of places where they can do

things that rejoice them, and a large number of young people are unable to deal with hobbies due to lack of money and time. Kojadin and associates (2013, according to Pehlic, 2014) conducted a comparative study of youth needs related to their free time also in Croatia, and according to their results, young people are rarely included in organized forms of leisure time. The realization that leisure time takes place in a structured way, in terms of dealing with sports, positively influences the development of the prosocial behavior of young people. Such an understanding calls for the socialization of peers or members of the sports team. Peer education for young people is very important, approval and acceptance by peers influences the development of individual self-esteem, school success, participation in extra-curricular activities, moral development and social behavior. In the circle of peers, a circle of prosocial behavior is established - when a young person behaves prosocially towards his/her peers, they return with such behavior (Pehlic, 2014). By observing the prosocial behavior displayed by team members, young athletes learn such behavior and will be more inclined to show it, especially if it is in some way stimulated. A strong point for such a claim is found in the research carried out by Mc Kenney (2001, according to Pehlic, 2014). In her work with young people who have a behavioral disorder, she applied a program to stimulate prosocial behavior based on learning observation.

The program included an assessment of what behavior in adolescents needs to be changed, then planning the process of changing, applying and evaluating the planned activities. The program of prosocial behavior included: use of special maps that showed the steps in manifesting certain behavior, role-playing activities, and watching videos. The results of this program confirmed that in the context of sporting activities, young people can be taught prosocial behavior if there is an appropriate program and appropriate social-pedagogical support.

Many researchers have focused their interest in exploring the nature of the altruistic personality, as well as on investigating the traits that cause and encouraging an individual to help others in different situations (Eisenberg, 2002, according to Carlo, 2006). In one of the classic studies (Eisenberg et al., 2006), it was observed how ten thousand students are willing to help in different situations, including the student's willingness to donate money to an orphanage, to give presents to children who need it, etc. The researchers measured the extent of the altruistic personality of each student. Surprisingly, the extent to which students were prosocial in one situation (for example, giving a lot of gifts to children) was not highly linked to the prosocial behavior of that individual in another situation. The mean correlation between assisting in one and the other situation was only $r = .23$. The result shows that one cannot predict how much someone will be ready to help, although it is known how much the individual was willing to help in another situation. Furthermore, studies conducted among children and adults indicate that individuals with high results on the altruism scale are not as ready to help as those with average values (Batson, 1997).

These settings certainly point out that not only individual differences are important, but also some other factors. Therefore, when interpreting prosocial behavior, account must be taken of the situation determinants, the gender of the helpers, the culture in which they grew up, and the current mood of the person himself.

CONCLUSION

Prosocial behavior is growing with the development of thought and emotional processes and is determined by situational factors and the attitude of prosocial behavior. When analyzing the prosocial behavior of primary and high school students in terms of the structure of leisure time, statistically significant differences were found in a way that students with struc-

tured leisure time performance compared to students whose leisure time is not structured. If we want to ensure that children and young people spend their leisure time in a socially positive way, it is necessary that leisure time includes activities that will relate to rest, personal development and rest. Accordingly, if the leisure time of children and young people were met with various socially acceptable activities, the greater would be the ability to adopt social skills such as the ability to build a good relationship, the ability to cooperate, the ability to manage conflicts and solve them. The population of children and youth actually forms its value system under various influences, i.e. under socialization agents, under the influence of family, school, friends, media, and the environment in which they spend their leisure time. The constructive use of leisure time for children and young people in a socially acceptable way is an indispensable problem that modern civilization should face if it seeks to focus on the development of a quality and meaningful life, and consequently, a comprehensive social action that would hinder negative ways of disposing leisure time for young people, as well as for directing their creativity in terms of proper social development.

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THE INFLUENCE OF THE EDUCATIONAL LEVEL AND THE EMPLOYMENT OF PARENTS ON THE DEVELOPMENT OF THE PHONOLOGICAL AWARENESS OF PUPILS OF THE LOWER PRIMARY SCHOOL AGE

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ABSTRACT

The main goal of this research was to examine the influence of the educational level and employment of parents on the development of phonological awareness of pupils of first and second primary school grades. The sample of respondents consisted of a total of 70 students whose age ranged from 78 months to 104 months. Observing respondents in relation to gender, 37 were male and 33 were female. The research was conducted in primary schools in the municipalities of Travnik and Novi Travnik in Bosnia and Herzegovina. The obtained results showed that the level of parents' education and the employment of parents influence the development of the phonological awareness of pupils of the first and second grades of primary schools. Namely, phonological awareness was more developed with pupils whose parents were employed and had a higher education level. The obtained results point to the need for professionals to pay more attention to the phonological development of children coming from families of low socioeconomic status. It is very important to timely identify students with difficulties in the development of phonological awareness with the aim of organizing and providing adequate professional assistance. If the student has difficulty in the field of phonological awareness, in that case the mentioned difficulties may also have a negative effect on the learning skills in other areas.

Keywords: phonological awareness, lower primary school age, parental education level, pupils, parents' employment

INTRODUCTION

Phonological awareness is a skill that involves the ability to perceive, manipulate, and reflect on language voices (Anthony & Lonigan, 2004). Andrešić et al. (2010) determine the phonological awareness as the ability to dis-

assemble words to voices and make voices in words, to connect voices with letters, and to understand the written word. For Yopp and Yopp (2000) phonological awareness is placed within a wider area called metalinguistic consciousness, which refers to the ability to think about language.

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Metalinguistic awareness means being aware and having control over your own language, and it is the ability to direct attention to language, regardless of the content of the language itself.

Phonological awareness, coupled with proper spoken language development and the established link phonemism, are included in the reading and writing predecessor skills (Andrešić et al., 2010). Pre-reading skills are a prerequisite for the development of reading skills, and they develop in pre-school age (Andrešić et al., 2010; Leffel & Suskind, 2013). Knowing the level of development of pre-reading skills at a certain age of a child's development can help us in early recognition of children who might have difficulties in later reading (Eric, 2014). Numerous authors have tried to determine how different circumstances can affect phonological awareness in children, and the socioeconomic status has emerged as one very important factor that can affect both phonological awareness and other developmental areas in the child. The quality of the family is defined through the socioeconomic status that constitutes the economic position of the family, the educational level of the father and mother, the furnishing of the home with stimulating and cultural content, or the organization and structure of the home life. Family socioeconomic status can have an impact on the child's development by primarily affecting the psychological functioning of the parents, and therefore the various aspects of upbringing, the environment in which the child grows up, and so on (Čudina-Obradović, 1995). Leffel and Suskind (2013) state that the linguistic environment of the child at the earliest is crucial to his cognitive development, school readiness and ultimate achievement in school. At the beginning of schooling, children differ strongly in the degree of development of phonological awareness (Kobola, 1977). How much the children are sensitive to phonemes in speech is partially dependent on the language experiences they had in the past years, and partly on the genetic factor (Yopp & Yopp, 2000). Child development and maturity of various developmental aspects, including cognition, motoring, social development, and speech - language development are important factors associated with starting school. Also, the learning of spoken and linguistic skills is essential for the educational achievement of students, and the success of acquiring school knowledge depends to a large extent on speech - language abilities (Begić, Duranović, & Karagić, 2016). For this reason, it is recommended that the environment in which the children are staying are to a greater extent be filled

with different reading material, and that they hear reading from the earliest days. This is the best way to encourage proper speech-language development in children (Smajlović, Begić, & Karagić, 2017). The above can only be provided by families with higher socioeconomic status, i.e. highly educated financially independent parents. A number of children, and most often those children from linguistically rich homes where they listened to stories and who participated in numerous word games, start school with already developed phonological awareness. A large number of children develop sensitivity to voices in the first two years of schooling. In these cases, this happens without special effort, and only the exposure to the stimulating classroom environment and the reading learning program is sufficient. But for some children, this is not enough, but they need additional training with the aim of developing phonological awareness (Yopp, 1995). Academic skills, in correlation with a low-literacy family environment, adversely affect the child's future skills (Aikens & Barbarin, 2008). This research sought to determine whether the socioeconomic status, that is, the education of mother and father, and their employment have an impact on the development of the phonological awareness of their children.

METHODS

Sample respondents

This study covered a total of 70 pupils of first and second grades of primary schools in the municipalities of Travnik and Novi Travnik in Bosnia and Herzegovina. 37 respondents were male and 33 were female. The chronological age of the subjects ranged between 78 and 104 months, respectively, 6 years and 6 months, and 8 years and 8 months.

Sample variables

The variables used in this research can be divided into two groups: socioeconomic status variables and variables for testing phonological awareness.

Variables of socioeconomic status

1. Educational level of mother (ELM): No education (NE); Lower professional education (LPE); High school education (HSE); Higher education and University degree (HE and UD); Master degree and PhD (MD.; PhD.);

2. Educational level of father (ELF): No education (NE); Lower professional education (LPE); High school education (HSE); Higher education and University degree (HE and UD); Master degree and PhD (MD.; PhD.);
3. Employment of the mother (EM): unemployed, employed,
4. Employment of the father (EF): unemployed, employed.

Variables for testing phonological awareness

1. The ability to connect syllables (COSYL),
2. The Ability to connect phonemes (COPHO),
3. Rhyme (RHYME),
4. Phonemic segmentation (PHOSEG),
5. Phoneme ejection (PHOEJC),
6. Phoneme displacement (PHODIS),
7. Spunerisms (SPUN),
8. Descriptive term of the phonological awareness (very low; low; below average; average; above average; high; very high).

Method of conducting research and measuring instrument

The research was conducted in primary schools in the municipalities of Travnik and Novi Travnik in Bosnia and Herzegovina. The Phonological Awareness Test (Hatcher, 2000) was used to examine phonological awareness, which was translated and adapted into the Bosnian language. In the course of this test, the participants' ability was examined to connect syllables, connect phonemes, rhyme, phonemic segmentation, phoneme ejection, phoneme displacement, and spunerisms. Each of these subtests contains the six items that were examined. The variable "The ability to connect syllables" was examined in such a way that the respondent, after hearing a spoken word disassembled on syllables by the examiner, connects the spoken words, or pronounces the word as a whole. The minimum score was 0, and the maximum score was 6 points. The variable "The ability to connect phonemes" was examined so that the interpreter pronounced the word vox by vox, and the respondent was supposed to connect the spoken voxes, or pronounce the whole word. On this variable, the minimum score was 0 points, and the maximum score was 6 points.

The variable "Rhyme" was examined in such a way that the respondent was offered three words, two of which rhyme, and one did not. The respondent was asked to answer which of the three words he did not

rhyme. For each correct answer the respondent received one point, and the point range ranged from 0 to 6 points. The variable "Phonemic segmentation" was examined so that the examiner pronounced the whole word, and the respondent was supposed to split the pronounced word into phonemes. The minimum score that the respondent could have achieved on this variable was 0, and the maximum score was 6 points. The "Phoneme ejection" variable was tested in a way that the whole word was pronounced for the respondent, and afterwards the interviewer was supposed to pronounce the same word, but without a certain vox. For each correct answer, the respondent received 1 point. The minimum score on this variable was 0, and the maximum score was 6 points. The variable "Phoneme displacement" was examined so that the examiner pronounced the words, and the respondent should speak these words from the end to the beginning of the word. On this variable, the range of points obtained ranged from 0 to 6. The variable "Spunerisms" was examined in the way that the examiner pronounced two words, one after the other, and the respondent should pronounce the first vox of the first word as the first vox of the second word, and the first vox of the second word should be pronounced as the first vox of the first word. The smallest number of points the respondent could achieve is 0, and the maximum 6 points. Descriptive terms of development of phonological awareness are: very low, low, below average, average, above average, high and very high development of phonological awareness. During the examination with the child, care must be taken to avoid giving non-phonological signs, especially in the part relating to the rhymes. Considering that it was possible to prepare a child for the expected response by changing the intonation, accent, volume, making a pause before the word or speech of the body in terms of changing contact with eyes, etc., all of the above was tried to be avoided in such a way that all the tasks were presented smoothly, without delay and in the same way. If a child asked for a task to be repeated, it was allowed to repeat it only once. Immediately after that, it was explained to the child that he/she needs to listen carefully, because the other words / voices will be spoken only once. The time limit was 10 seconds for each task. In order to prevent them from unnecessarily making mistakes and being wrong, the testing was interrupted if the child made a mistake in eight consecutive tasks.

The "Parent Questionnaire" was used to collect data related to socio-economic variables, which was constructed for the purposes of this research.

The questionnaire was forwarded to the parents of the children involved in the research. Namely, both parents filled out a questionnaire asking questions about their level of education and employment. All respondents were individually examined by the said measuring instrument, with the prior consent of the school, as well as the parents.

Statistical data processing

Research data were processed in the statistical package SPSS 20.0 for Windows. The basic statistical parameters, measures of central tendency, dispersion measures, frequency and percentages were calculated, and a tabular presentation of results was performed. A multivariate regression analysis method and categorical regression analysis were used to check the hypothesized

research findings. An alpha value of 5% was used to assess statistical significance.

RESULTS

The research "The influence of the educational level and the employment of parents on the development of the phonological awareness of pupils of the lower primary school age" was conducted in the municipalities of Travnik and Novi Travnik in Bosnia and Herzegovina, encompassing a sample of 70 respondents. Of the total number of respondents, 37 male respondents had an average chronological age of $7.26 \pm .72$ years, and 33 respondents were females - average chronological age of $7.32 \pm .74$ years (Table 1). The results of the hi square test showed that there was no statistically significant difference between genders ($\chi^2 = .22$; $p = .63$).

Table 1. Measures of central tendency and dispersion measures

Gender	N	M	SD	SE
Male	37	7.26	.72	.11
Female	33	7.32	.74	.12

Regarding the educational structure, it was found that the highest percentage of parents completed high school, while the smallest percentage of parents is without education. With high school education there is 58.57% of mothers, 31.43% of mothers are with lower professional education, while 5.71% of mothers have higher education and university degree. Com-

pared with mothers, the percentage of fathers with high school education is higher (70%), while 21.43% are fathers with lower professional education. The percentage of fathers is proportionate to the percentage of mothers with regard to the higher education and university degree (5.71%). None of the parents had a master degree or PhD.

Table 2. Overview of parental education levels

Variable	Mother %	Father %
No education	4.28	2.85
Lower professional education	31.43	21.43
High school education	58.57	70.00
Higher education and University degree	5.71	5.71

The results in Table 3 show that, when it comes to employment, 57.1% of parents are employed, while 42.9% of parents are unemployed. Comparing the results of employment between mothers and fathers, it is evident that a higher percentage of fathers are employed (78.6%) compared to mothers

(35.7%). The results of the hi square test showed that the differences between parents relative to employment were statistically significant ($\chi^2 = 26.25$, $p = .00$), or at the statistical significance level of .01, the percentage of fathers employed in comparison with mothers.

Table 3. Overview of parents' employment

Parents	Employment		
		NO	YES
Mother	N	45	25
	%	64.3%	35.7%
Father	N	15	55
	%	21.4%	78.6%
Total	N	60	80
	%	42.9%	57.1%

$\chi^2 = 26.25$; $p = .00$

The results in Table 4 show that the highest percentage of respondents achieved 6 points on variables "The ability to connect syllables" (74.3%), "Phonemic segmentation" (91.4%) and "The ability to connect phonemes" (84.3%). On the variable "Rhyme", the highest percentage of respondents (32.9%) achieved 2 points, 28.6% achieved 3 points, while

18.6% achieved 4 points. On the "Phoneme ejection" variable, the highest percentage of 21.4% of respondents achieved 4 points, while a proportionate percentage of respondents (11.4%) achieved 0 and 1 point. On the variable "Spunerisms", the highest percentage of respondents achieved 0 and 1 point.

Table 4. Distribution of respondents in relation to variables of phonological awareness

Variables		Development of phonological awareness						
		0	1	2	3	4	5	6
COSYL	N	-	-	-	-	1	17	52
	%	-	-	-	-	1.4	24.3	74.3
COPHO	N	1	3	-	-	2	5	59
	%	1.4	4.3	-	-	2.9	7.1	84.3
RHYME	N	3	6	23	20	13	5	-
	%	4.3	8.6	32.9	28.6	18.6	7.1	-
PHOSEG	N	2	-	1	-	1	2	64
	%	2.9	-	1.4	-	1.4	2.9	91.4
PHOEJC	N	8	8	9	11	15	6	13
	%	11.4	11.4	12.9	15.7	21.4	8.6	18.6
PHODIS	N	7	6	7	6	8	14	22
	%	10.0	8.6	10.0	8.6	11.4	20.0	31.4
SPUN	N	26	30	7	-	2	4	1
	%	37.1	42.9	10.0	-	2.9	5.7	1.4

Legend: The ability to connect syllables (COSYL), The Ability to connect phonemes (COPHO), Rhyme (RHYME), Phonemic segmentation (PHOSEG), Phoneme ejection (PHOEJC), Phoneme displacement (PHODIS), Spunerisms (SPUN)

The results in Table 5 show that the highest percentage of children had an average developed phonological awareness (34.29%), while the smallest percentage of children, or one child, showed a very low and low developed phonological awareness. 4.29% of children

showed below the average level of development of phonological awareness. The above-developed phonological awareness had 28.57% of children, 21.43% high and 8.57% very highly developed phonological awareness.

Table 5. Distribution of respondents in relation to the development of phonological awareness

Variable „Descriptive term of the phonological awareness“	%
Very low	1.43
Low	1.43
Below average	4.29
Average	34.29
Above average	28.57
High	21.43
Very high	8.57

In order to determine the influence of the educational level of the parents on the development of the phonological awareness of pupils of the first and second grades of primary schools, the multivariate regression analysis method was applied. The obtained results in Table 6 show that the coefficient of multiple correlation is .39, and the corrected coefficient of multiple

correlation is .15, indicating that 15% of the development of phonological awareness of the pupil can be explained under the influence of the educational level of the parent. The results of the F-coefficient showed that the educational level of the parents statistically significantly influenced the development of the phonological awareness of the pupils.

Table 7 shows the results of a beta coefficient representing a standardized partial regression coefficient. From the table it can be noticed that the predictor "Educational level of the father" achieved a statisti-

cally significant influence on the development of phonological awareness of pupils, that is, pupils whose fathers have a higher degree of professional development have a more developed phonological awareness.

Table 6. Results of regression analysis

Dependent variable		SK	df	PSK	F	p
Phonological awareness	Regression	539.77	2	269.88	6.06	.00
	Residual	2981.09	67	44.49		

$R = .39$; $R^2 = .15$;

Table 7. Results of beta coefficient

Dependent variables	Predictors	Beta	t	p
Phonological awareness	Educational level of mother	.09	.64	.52
	Educational level of father	.31	2.10	.04

A categorical regression analysis was applied in order to determine the influence of parents' employment on the development of phonological awareness of pupils of first and second grades in primary schools. The coefficient of multiple correlation is .36, and the corrected coefficient of multiple correlation is .13, indicating that 13% of the development of phonological awareness of the pupil can be explained under the influence of the parents' employment. The results of the F coefficient showed that the employment of parents

statistically significantly influenced the development of the phonological awareness of the pupils (Table 8). Table 9 shows the results of the beta coefficient, and it can be noticed that both predictors "Employment of the mother" and "Employment of the father" have a statistically significant influence on the development of phonological awareness of pupils.

Also, in Table 9 it can be seen that the employment of the mother has a significant influence on the development of the phonological awareness of the pupils.

Table 8. Results of regression analysis

Dependent variable		SK	df	PSK	F	p
Phonological awareness	Regression	9.43	2	4.71	5.22	.00
	Residual	60.56	67	.90		

$R = .36$; $R^2 = .13$;

Table 9. Results of beta coefficient

Dependent variables	Predictors	Beta	F	p
Phonological awareness	Employment of the mother	.27	7.17	.01
	Employment of the father	.22	4.25	.04

DISCUSSION

In this research, whose main goal was to examine the influence of the educational level and employment of parents on the development of phonological awareness of pupils of the first and second grades of primary schools, the sample covered 70 respondents, of which 37 were male and 33 were female. The results of this research have shown that education of parents significantly influences the development of the pho-

nological awareness of their children. The results obtained correspond with the results of other authors' research. Namely, parents play a fundamental role when it comes to speech - language development of a child. Also, parents need to provide an incentive voice environment by talking to the child about different topics and life situations. In doing this, they should take care to make the speech clear and adapted to the child's age. Telling a story is the simplest way of stimulating speech - language development.

This initially involves listening to picture books, viewing images, detecting the essential ones. Noack (2004) states that more educated parents are more likely to provide better education, and help the child learn. Also, they place greater demands on the child, convey attitudes about the importance of schooling, and more involve the process of educating children. Eccles and Harold (1993) emphasize that scientists have evidence of the positive effects of parents' involvement in the education process. In this way, parents and schools continually encourage child development and learning. Research shows that parents with higher education are more involved in child education.

Previous research has shown that children who come from low socioeconomic backgrounds and whose mothers have low levels of education are at greater risk of academic failure (Washington, 2001, according to Martin, 2006). Regardless of the families' socioeconomic status, it is important to emphasize that active involvement of parents in their children's educational process is necessary for achieving better academic skills. Accordingly, Henderson and Berla (1994) state that children benefit greatly from the parental involvement in the education process. Children tend to achieve more regardless of the socioeconomic status, level of parental education, ethnic or racial affiliation if their parents are part of the process of their education. In this case, children achieve better results, regularly write homework, are less included in supplementary classes and less absent from school. Hoff (2003) points out that more educated parents talk more to children, they apply more complex and different language structures, resulting in more developed language and reading skills in the child. The results of Araújo and Costa (2015) survey show that the level of parenting is linked to the child's reading achievement. Feinstein (2000) states that parents' education is a very important indicator of his child's success. Fekonja-Peklaj and Marjanovič-Umek (2011) have shown in their research a significant link between the level of mother's education and the results of children aged 4 years and 1 month on a language test and a review of the story with pictures. The mothers of higher education provided children with a more stimulating environment: their speech is more directed to the child, they read the stories together with the child, go to the library and on children's plays. The results of the research carried out by Burušić, Babarović and Marković (2010) in Croatia on a sample of primary school pupils show that the impact of the education of the mother on the school achievement of children is,

as a rule, somewhat greater than the father's. Goldin (2007, according to Pehlic & Spahic-Jasarevic 2012) states that socioeconomic status is statistically significantly related to mother's involvement, indicating that mothers from a higher socio-economic layer are more involved in child's school life. We can conclude that poorly developed phonemic skills distinguish children from families of low socioeconomic status from their peers (Lieberman, Rubin, Duques, & Carlisle, 1985). Children who grow up with more educated parents of higher socioeconomic status have greater likelihood of meeting with developmentally appropriate books, reading, being encouraged by parents, and academic thinking (Noack, 2004).

In addition to parents' education, the study also sought to determine the impact of parents' employment on the development of the phonological awareness of their children, whereby the results proved to be statistically significant. Employment of the mother affects the development of phonological awareness rather than the employment of a father. Hoffman (1998) found that maternal employment has a significant impact on children, or children of employed mothers achieve more academic results. Barling, Zacharatos and Hepburn (1999) developed and tested a model in which children who perceive their parents as uncertain about work, cognitively disturbed, negatively affecting their academic success. Matković (2010) states that richer parents who are more often and better educated personally help their children or give them help in the form of instructions, they can better lead children through the educational process. Williams Shanks et al.; (2010) emphasized that parents serve as models for children, transfer their aspirations and expectations, and develop the child's behavior needed to achieve the goals of education.

CONCLUSION

The results of this research have shown that the level of parental education affects the development of phonological awareness of pupils of first and second grades of primary school. Phonological awareness is more developed in pupils whose parents have a higher education level. The educational level of the father has more influence on the development of the phonological awareness of the pupils of the first and second grades of the primary schools, compared to the educational level of the mother. Also, it was found that the employment of parents affects the development of the phonological awareness of pupils of the first and second grades of primary schools.

The children of the employed parents have a better developed phonological awareness. The obtained results indicate the need for speech and language therapists, during their professional work with children whose parents are unemployed and with lower education, to pay more attention to their development of phonological awareness. Therefore, professionals should devote more time to these children in reading letters and reading lessons, that is, they should pay more attention to the work and the provision of services that involve the adoption and development of prereading skills, because this difficulty can also be reflected in learning skills in other areas. Speech and language therapists should involve parents more in the child's school activities in order for them to participate directly with teachers and speech therapists through interactive cooperation in stimulating the child's speech-language development. Learning and developing all speech and language skills is very important for the educational and academic success of pupils, and by encouraging these areas by professionals and the family, we can provide a quality and adequate basis for the future development and improvement of children's abilities.

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IMPACT OF CONVENTIONAL STOCK MARKET INDEX ON ISLAMIC STOCK MARKET INDEX IN BOSNIA AND HERZEGOVINA

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ABSTRACT

This study analyzes the impact of conventional index (SASX-30) on Islamic index (SASE-BBI) in Bosnia and Herzegovina. In the study are used daily index observations spanning in a period from October 2016 until May 2018. The data is obtained from the Sarajevo Stock Exchange database. Vector Auto-regression analysis (VAR) and Impulse response functions are used in order to estimate the impact. The results show that there is a significant negative impact of conventional index volatility (SASX-30) on Islamic index volatility (SASX-BBI) in Bosnia and Herzegovina.

Keywords: conventional stock market index, Islamic stock market index, impact, B&H

INTRODUCTION

Islamic financial services around the world are witnessing rapid growth in the recent decades. There is significant increase in the demand for Islamic financial instruments. More precisely, there is significant increase in the demand for investing in Islamically acceptable stock market indices. These indices are based on the Shariah law, and therefore they are acceptable from the Islamic perspective.

There are few worldwide accepted methodologies for creating Islamic stock market index. These methodologies include FTSE global Islamic market index Shariah rules, MSCI Global Islamic market index Shariah rules etc.. These screening methodologies usually include two types of filters including business screening and financial screening. After fitting both of the screening criteria a stock can enter the list of

companies listed in the Islamic stock market index. Furthermore, these aspects of companies listed in the index are checked periodically over time to see whether a company fits the criteria over time.

„Al-Khazali, Lean and Samet (2013) highlight that the investment in companies that are compliant with Islamic laws is consistent with socially responsible and ethical investment, in which investors select their stocks based on their religious beliefs“. (Djedovic & Ergun, 2018).

In the last few decades, the international Islamic financial market has gathered a significant momentum in attracting capital from both Muslim and non-Muslim countries and investors. There are few favored global Islamic indices such as DJIM, FTSE, MSCI etc. Furthermore, the development of Islamic capital markets, in both domestic and global markets, is showing positive trends over time.

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Sarajevo Stock Exchange introduced first Islamic index (SASX-BBI) in Bosnia and Herzegovina in October 2016. The index is introduced in cooperation with Bosna Bank International.

According to Dharani and Natarajan (2011), Islamic Index comprises Shari'ah compliant stocks which provide essential advantages of being socially responsible and ethically sound. Hassan and Girard (2011) referred to the McKinsey Management Consulting Firm report and concluded that Islamic finance is a new force in the financial market place as this niche market is attracting potential investors.

Therefore, the research that investigates Islamic indices' behavior is of a great significance nowadays, due to its higher importance and popularity, as well as the need for a deeper investigation of this financial sector, since the literature covering these issues is still developing.

This type of research could be beneficial for the academic society as well as for the investors.

This study examines the impact of conventional stock market index (SASX-30) on Islamic stock market index (SASX-BBI) return and volatility in Bosnia and Herzegovina. Study investigates one of the potential factors that affects Islamic stock market index (SASX-BBI) return and volatility. The factor being mentioned is the return and volatility rate of the conventional counterpart index.

Despite the fact that the academic research on the relationship between conventional stock market indices is widely analyzed, there is a certain gap in the literature pertaining to the relationship between conventional and Islamic stock market indices. Furthermore, this is the first research of this type in Bosnia and Herzegovina.

Based on some of the previous research investigating conventional as well as Islamic stock market indices, there are evidences that conventional and Islamic stock market indices are similarly influenced, and that conventional indices impact the movement of Islamic ones.

However, some of the studies find that these indices are independently moving.

Since the literature investigating the behavior of the Islamic stock market indices is still developing, it is important to investigate if there is an impact on the Islamic stock market index return and volatility in Bosnia and Herzegovina, coming from the conventional counterpart index.

The results from this study suggest that volatility of conventional SASX-30 index has significant nega-

tive impact on the volatility of the Islamic index, SASX-BBI, in Bosnia and Herzegovina.

LITERATURE REVIEW

Studies investigating relationship and potential impact of conventional indices on Islamic ones, and viceversa, are still developing. Based on some of the fundamental differences between Islamic and conventional stock market indices, it might be expected that there should not be potential transmission of risk or volatility across Islamic and conventional indices.

Albaity and Ahmad (2008) examined the relationship between the Kuala Lumpur Shariah Index (KLSI) and the Kuala Lumpur Composite Index (KLCI) during the period 1999-2005. They found that the short-run causality is bi-directional between the two indices.

Bakri Abdul et al. (2014) found significant short-run bi-directional causality between Malaysian Islamic stock market and conventional stock market.

Majdoub and Mansour (2014) find weak correlation between US and five Islamic emerging equity markets over time.

Nazlioglu et al. (2015) examined whether there is volatility transmission between the Dow Jones Islamic stock index and the three conventional stock markets for the U.S., Europe and Asia. They found that there is volatility spillover between Islamic and conventional indices. Furthermore, Kim and Sohn (2016) in their study found unidirectional volatility spillover from the U.S. conventional stock market to the Islamic stock indices of Islamic countries, but not vice versa. The Islamic stock index is also influenced by the U.S. conventional stock index (Dow Jones Industrial Average – DJIA).

Bahloul, Mroua and Naifar (2017) examined the impact of the conventional index return and volatility on Islamic stock market return for the period 2002 to 2014 (monthly data). They included ten developed and ten emerging markets. The results suggest that the conventional index return has significant impact on Islamic index return.

Furthermore, Djedovic and Ergun (2018) investigated eventual volatility spillover between conventional and Islamic index in the UK. Their results suggest that there is significant positive impact of Dow Jones UK index volatility on Dow Jones UK Islamic index volatility.

To summarize, empirical literature on the issue of volatility transmission between Islamic and conventional equities generally shows that there is relationship and volatility spillover between conventional and Islamic indices.

DATA AND METHODOLOGY

In this study used are daily observations of conventional and Islamic stock market index in Bosnia and Herzegovina. The data spans from the October 2016 to May 2018. We obtained the data from the Sarajevo Stock Exchange database. Vector Auto-regression analysis and Impulse response functions are used in order to estimate the impact.

The arithmetic return of the indices is estimated by subtracting the index value at time $t - 1$ from the index value at time t and dividing it by the index value at time t as shown in Eq. (1), where R_t is the return at time t , P_t is the index at time t , and P_{t-1} is the index at time $t - 1$.

$$\text{Equation 1. } R_t = (P_t - P_{t-1})/P_{t-1}$$

The next step is the estimation of the volatility of the indices. Volatility is measured as square of the deviations from the mean. We consider that Δy_t indicates the series with deviations from means.

As it can be seen in the Equation 2., the volatility of the indices is estimated as:

$$\text{Equation 2. } \Delta y_t^2 = (\Delta y_t - \Delta \bar{y})^2$$

where $\Delta \bar{y} = \Sigma \Delta y_t / T$.

EMPIRICAL ANALYSIS AND RESULTS

In this part of paper presented are graphs representing the movement of the two indices (price, return and volatility) over time, the unit root tests for the time series used in the analysis part, as well as the results of the VAR analysis and impulse response functions.

Graphical representation

In this section presented are prices, return and volatility values of conventional (SASX-30) and Islamic (SASX-BBI) indices in Bosnia and Herzegovina for the observed time period.

In the Figures 1 and 2 presented are the prices of the indices for the observed period. In the Figures 3 and 4 presented are the return values of the indices. Furthermore, in the Figure 5 and 6 presented are volatility values of the two indices for the observed period.

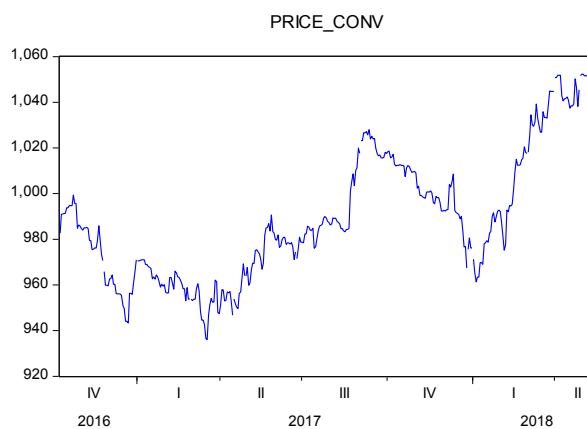


Figure 1

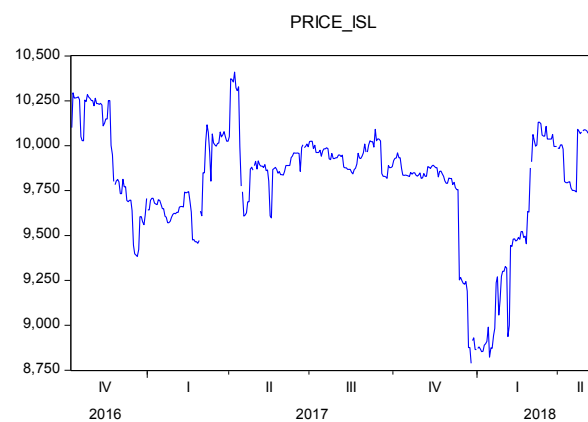


Figure 2

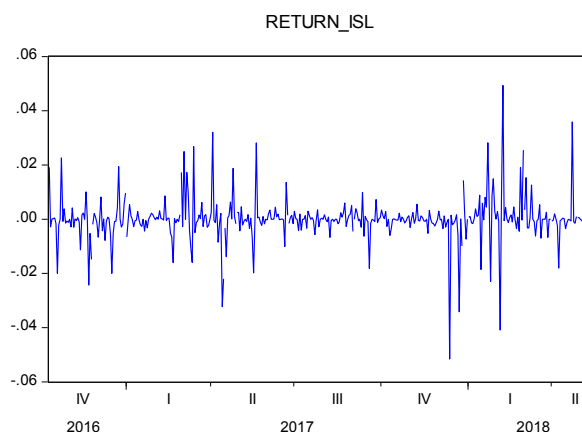


Figure 3

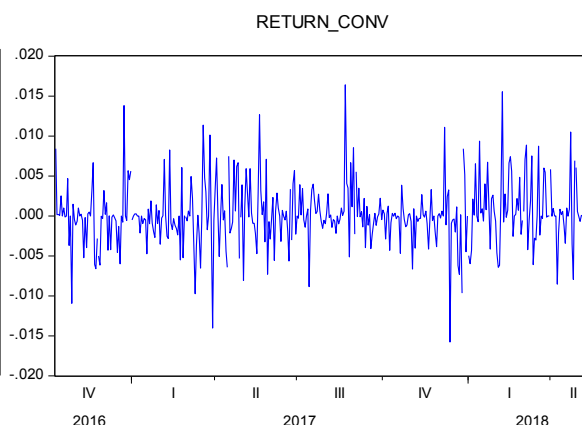


Figure 4

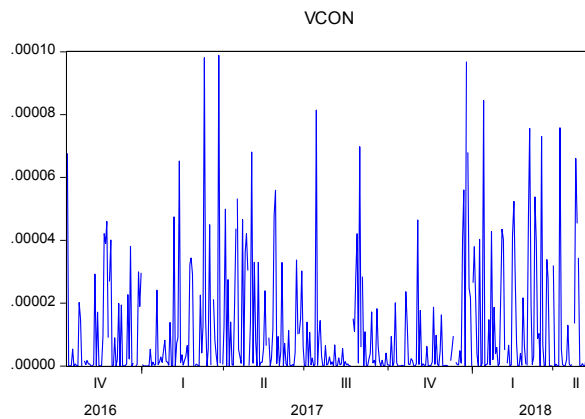


Figure 5

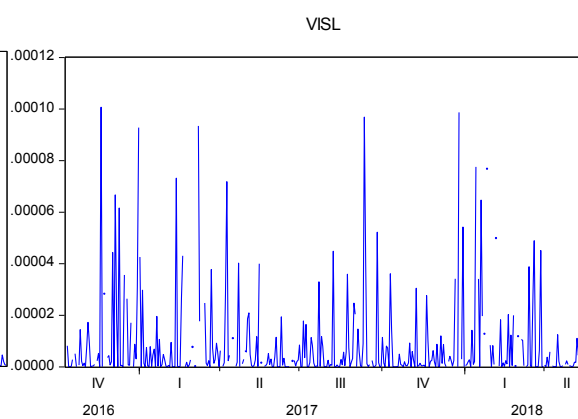


Figure 6

Unit root test

In this section presented are the ADF unit root tests for

the variables used in the study. The results given in Table 1., Table 2., Table 3. and Table 4. suggest that the variables used in the study are stationary at the levels.

Table 1. ADF Unit root test for SASX-30 return

Null Hypothesis: RETURN_SASX_30 has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=16)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-19.00880	0.0000
Test critical values:		
1% level	-3.446608	
5% level	-2.868601	
10% level	-2.570597	

*MacKinnon (1996) one-sided p-values.

Table 2. ADF Unit root test for SASX-BBI return

Null Hypothesis: RETURN_ISL has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=16)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-19.37085	0.0000
Test critical values:		
1% level	-3.446608	
5% level	-2.868601	
10% level	-2.570597	

*MacKinnon (1996) one-sided p-values.

Table 3. ADF Unit root test for SASX-30 volatility

Null Hypothesis: VCON has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=16)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-20.48159	0.0000
Test critical values:		
1% level	-3.446608	
5% level	-2.868601	
10% level	-2.570597	

*MacKinnon (1996) one-sided p-values.

Table 4. ADF Unit root test for SASX-BBI volatility

Null Hypothesis: VISL has a unit root			
Exogenous: Constant			
Lag Length: 1 (Automatic - based on SIC, maxlag=16)			
		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-11.70661	0.0000
Test critical values:	1% level	-3.446650	
	5% level	-2.868620	
	10% level	-2.570607	
*MacKinnon (1996) one-sided p-values.			

Vector Autoregression Analysis (VAR)

Vector autoregression (VAR) is a model used to find the linear interdependencies among time series. A VAR has more than one dependent variable and has more than one equation. VAR analysis enables us to estimate the

predictive power of the variables. By using VAR framework, we carry out the analysis to assess the predictive power of the conventional index in Bosnia and Herzegovina in explaining the Islamic index behavior. Vector Autoregressive Analysis (VAR) requires that the data is stationary in order to avoid spurious regression.

Table 5. Vector autoregression analysis (VAR)

Vector Autoregression Estimates				
Sample (adjusted): 10/14/2016 5/16/2018				
Included observations: 396 after adjustments				
Standard errors in () & t-statistics in []				
	RETURN_SASX_BBI	RETURN_SASX_30	VOL_SASX_BBI	VOL_SASX_30
RETURN_SASX_BBI (-1)	0.038411 (0.06000) [0.64014]	0.035822 (0.02885) [1.24152]	-0.001559 (0.00181) [-0.85916]	-9.80E-05 (0.00024) [-0.40692]
RETURN_SASX_BBI (-2)	-0.038379 (0.05974) [-0.64243]	-0.046169 (0.02873) [-1.60722]	-0.002501 (0.00181) [-1.38399]	-0.000405 (0.00024) [-1.68884]
RETURN_SASX_30 (-1)	0.009297 (0.12686) [0.07329]	0.014079 (0.06100) [0.23080]	0.002264 (0.00384) [0.59007]	0.000503 (0.00051) [0.98706]
RETURN_SASX_30 (-2)	0.010145 (0.12621) [0.08038]	-0.008608 (0.06069) [-0.14183]	0.000354 (0.00382) [0.09265]	0.000241 (0.00051) [0.47531]
VOL_SASX_BBI (-1)	1.102886 (1.90880) [0.57779]	-0.558807 (0.91786) [-0.60882]	-0.019438 (0.05773) [-0.33670]	-0.004134 (0.00766) [-0.53937]
VOL_SASX_BBI (-2)	3.989780 (1.91063) [2.08820]	-0.287944 (0.91874) [-0.31341]	0.247958 (0.05779) [4.29104]	0.026353 (0.00767) [3.43513]
VOL_SASX_30 (-1)	-17.45058 (14.6911) [-1.18783]	2.758868 (7.06431) [0.39054]	0.045718 (0.44432) [0.10289]	-0.012562 (0.05899) [-0.21296]
VOL_SASX_30 (-2)	-6.796584 (14.7286) [-0.46146]	3.646686 (7.08233) [0.51490]	-0.931227 (0.44545) [-2.09052]	-0.064453 (0.05914) [-1.08987]
C	9.00E-06 (0.00049) [0.01822]	0.000117 (0.00024) [0.49103]	6.42E-05 (1.5E-05) [4.30050]	1.49E-05 (2.0E-06) [7.50497]
R-squared	0.019381	0.017623	0.054684	0.042545
Adj. R-squared	-0.000890	-0.002684	0.035143	0.022752
Sum sq. resids	0.025760	0.005956	2.36E-05	4.15E-07
S.E. equation	0.008159	0.003923	0.000247	3.28E-05
F-statistic	0.956084	0.867808	2.798367	2.149552
Log likelihood	1346.888	1636.834	2732.276	3531.883
Akaike AIC	-6.757011	-8.221381	-13.75392	-17.79234
Schwarz SC	-6.666524	-8.130895	-13.66343	-17.70185
Mean dependent	-2.01E-05	0.000158	6.63E-05	1.53E-05
S.D. dependent	0.008155	0.003918	0.000251	3.31E-05

The empirical results obtained through Vector Autoregressive method are summarized in the Table 5. The results from the Table 5. indicate that the volatility of the conventional index (SASX-30) has a negative significant impact on the volatility of Islamic index (SASX-BBI). This impact comes after two periods (lag -2). This suggests that the higher volatility of the conventional index, the volatility of Islamic index in Bosnia and Herzegovina will be lower after two periods. This suggests that when there is higher amount of risk in conventional index, Islamic index will be less risky after two periods.

The other results from the Vector autoregression analysis suggest that conventional index return has no significant impact on Islamic index return, meaning that Islamic index return is independent from conventional index return in Bosnia and Herzegovina. Furthermore, conventional index return has no significant impact on Islamic index volatility. Also, from the results it can be noticed that the volatility of conventional index in Bosnia and Herzegovina has no significant impact on Islamic index return.

By summarizing the results of VAR analysis, it only conventional index volatility in Bosnia and Herzegovina has negative significant impact on Islamic index volatility. The other results are not significant.

Impulse Response Functions (IRFs) Results

In order to test how the Islamic index in Bosnia and

Herzegovina responds to the short-run temporary shocks in the counterpart conventional index, this study employs the impulse response function. The impulse response function is derived from the estimation of the VAR model and are presented in Figures 7 to 10.

As Mohsen et al. (2017) state „impulse response functions (IRFs) are used to study the dynamic effects of a particular variable's shock on the other variables that are included in the same model. Through the IRF we can learn whether the response of one variable to changes in the other variables is positive (the point estimate is above zero) or negative (point estimate is under zero) and whether it is significant or not. If the point estimate of the IRF passes through the zero line, the response is insignificant“. In this study we use Cholesky decomposition adjusted response functions.

Figure 7 shows that SASX-BBI index return responds negatively to a shock in SASX-30 return after the third period, and the impact of the shock comes to its peak in the fifth period. After the fifth period, the impact starts to fade away and becomes zero at the end of sixth period. This means that there is a negative effect of a shock of SASX-30 index return on SASX-BBI index return. This result indicates that Islamic index in Bosnia and Herzegovina is not immune to the shocks in the conventional index, and that the higher return of the conventional index causes a decrease in the return of the Islamic index.

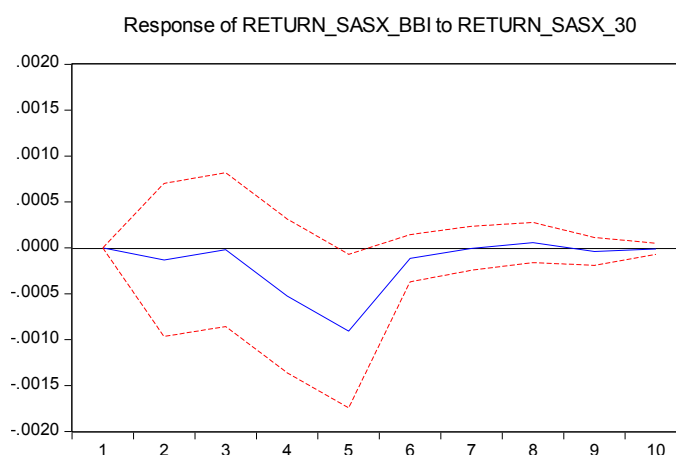


Figure 7.

As it can be seen in the Figure 8 the return of SASX-BBI index is effected by the shock in volatility of SASX-30 index. It responds negatively to a shock in the first, second and third period. After that, in the fourth and the fifth period the response

is positive. After the fifth period the impacts fades away. This result indicates that the return of Islamic index is not immune to the shocks in the conventional index volatility in Bosnia and Herzegovina.

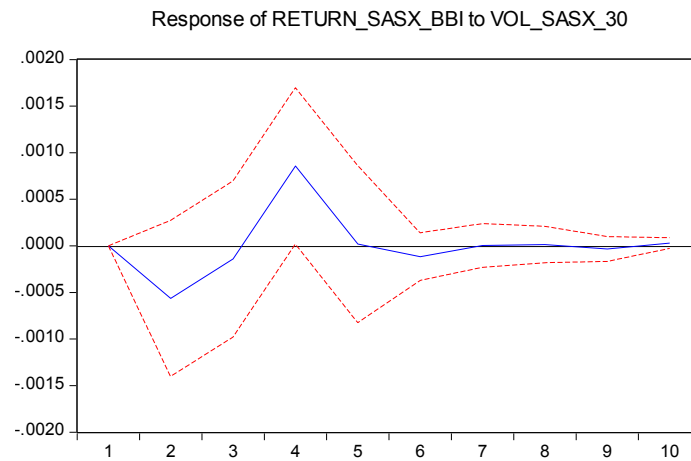


Figure 8.

Furthermore, the result in Figure 9 shows that the volatility of SASX-BBI index responds negatively to a shock in SASX-30 index return. The negative response starts during the third period and fades away during the fifth period. The result suggests that Is-

lamic index return in Bosnia and Herzegovina is not immune to the shocks coming from the counterpart conventional index return. Meaning, that when the return of the conventional index is higher the volatility of Islamic index in Bosnia and Herzegovina is lower.

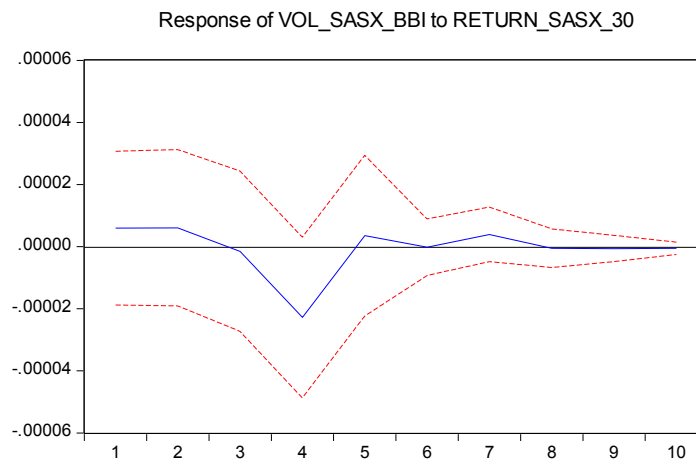


Figure 9.

Figure 10 shows that SASX-BBI index volatility responds negatively to a SASX-30 volatility during the third period. After that, the response of SASX-BBI volatility to the shocks in SASX-30 volatility is positive, during the fourth and fifth period. Dur-

ing the sixth period the response fades away and becomes zero. The results from Figure 4 suggest that Islamic index volatility in Bosnia and Herzegovina is not immune to the conventional index volatility changes.

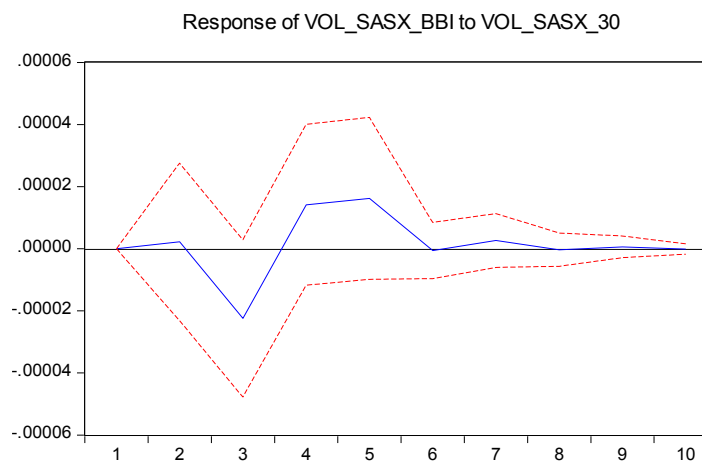


Figure 10.

SIGNIFICANCE AND CONTRIBUTION OF THE STUDY

This is, to our best knowledge, first and pioneer empirical study regarding Islamic stock market index in Bosnia and Herzegovina. So, we can state that the study partially fills the gap regarding this topic in Bosnia and Herzegovina. However, more studies of this type should be performed in the future. Furthermore, this study contributes to the existing international literature regarding Islamic index behavior, and the impact of conventional indices on Islamic ones. Also, this study provides valuable information to the potential investors, who can better understand the relationship between conventional and Islamic index, and their eventual connections and interdependency.

LIMITATION AND FUTURE STUDIES RECOMMENDATION

The main limitation of the study is the shortness of the time series used in the study. The main reason for this limitation is that Islamic index in Bosnia and Herzegovina is introduced in the October 2016. Therefore, relatively short period of indices movement could be observed. So, in the future, the new studies would have possibility to observe longer period of indices movement, and it can strengthen the reliability of the results. Furthermore, the studies can also observe eventual impact of Islamic index in Bosnia and Herzegovina on the conventional counterpart index.

CONCLUSION

The aim of this research was to investigate eventual impact of conventional stock market index (SASX_30) return and volatility on Islamic stock market index (SASX_BBI) return and volatility in Bosnia and Herzegovina. In order to examine the impact, conducted are the Vector autoregressive analysis (VAR) and the generalized impulse-response functions.

The results of the VAR analysis indicated a significant negative impact of the volatility of conventional index in Bosnia and Herzegovina on the volatility of Islamic index in Bosnia and Herzegovina, meaning that there is volatility spillover between conventional and Islamic index. This result suggests that when there is higher volatility of conventional index, Islamic index will be less volatile after two periods. Meaning that when conventional index is riskier, Islamic index is less risky after two periods.

However, the analysis showed that there is no significant impact of conventional index return and conventional index volatility on the Islamic index return. Also, the analysis showed that there is no significant impact of conventional index return on Islamic index volatility. These results suggest that Islamic index is immune to these type of changes in conventional index.

In order to examine the responsiveness of the transmission mechanisms of the two indices short-run temporary shocks, the generalized volatility impulse response functions were derived. The results indicated that Islamic index return and volatility are not immune to the shocks in conventional index return and volatility. There was a volatility transmission from the conventional index in Bosnia and Herzegovina to the Islamic index in Bosnia and Herzegovina. Furthermore, the shocks in the conventional index return are transmitted to the Islamic index return and volatility.

Our results are in line with the most of the existing literature and research, which also finds relationship between conventional and Islamic indices (Albaity and Ahmad (2008), Bakri Abdul et al. (2014), Majdoub and Mansour (2014), Nazlioglu et al. (2015), Kim and Sohn (2016), Bahloul, Mroua and Naifar (2017), Djedovic and Ergun (2018)).

Based on the results of the study we can state that Islamic index in Bosnia and Herzegovina can be good option for the investors when there is higher volatility/risk in the conventional index, because when the volatility of the conventional index increases, the volatility of the Islamic index would decrease. So, it can be considered as a diversification tool for the investors. Therefore, the Islamic equity investments in Bosnia and Herzegovina could constitute a viable alternative for risk-averse investors who wished to hedge their investments against the turmoil of the conventional stock market in Bosnia and Herzegovina.

For the other results regarding the first part of analysis, we stated that Islamic index return is moving independently from the conventional index return and volatility, meaning that it is immune to these changes. This might be attributed to the effect of Shariah principles which makes Islamic stock indices different compared to the conventional ones.

However, when we look at the results of the second part of analysis, it can be stated that Islamic index return and volatility is not immune to the short-run temporary shocks in the conventional index return and volatility. In this sense, it can be stated that there is certain short-run temporary dependency of the Islamic index to the conventional index.

This information regarding short-run temporary shocks is also valuable for the investors.

The explanation for this could be found in the following argument. As Djedovic and Ergun (2018) mention, „in a market economy, the value of a firm can be influenced both directly and indirectly. Also, Islamic scholars have made some concessions on the permissible degree of financial leverage and the level of interest income in relation to Islamic indices constituent firms. Thus, Islamic indices could be expected to be sensitive to conventional stock index changes“.

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PERCEPTION OF PARENTAL SUPPORT BY DEAF AND HARD-OF-HEARING STUDENTS

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ABSTRACT

The aim of the paper was to determine the perception of parental support and understanding by deaf and hard-of-hearing students. The sample consisted of 47 deaf and hard-of-hearing students, both genders, with an average age of 16 ± 1.27 years. Children's Perceptions of Parents Scale, (Grolnick, Ryan & Deci, 1991), which consists of three subscales, and which measure parental involvement, support of autonomy and parental warmth, especially for the mother; especially for the father was used in this research. The data were processed by descriptive analysis, and the t-test was used to test the mother's support perception difference in relation to father's support perception. The results showed that deaf and hard-of-hearing students mostly positively perceived the parent involvement, support of autonomy and warmth of both parents, but a statistically significant difference in the individual perception of parents was found in favor of the mothers.
Keywords: perception, parental support, deaf, hard-of-hearing

INTRODUCTION

The presence of hearing loss in childhood puts a child at risk for language, social, and academic difficulties. It can negatively affect the quality of life, even if the hearing loss is mild (Burkey, 2006; see Andreeva, Celo, & Vian, 2017).

Becker, Flower, Glass and Newcomer (1984) according to Olaosun and Ogundiran (2013), argue that hearing loss limits a person's ability to interact with his environment and socially with family and friends and to receive and interpret information in the environment.

The delays in language and socioemotional development are often attributed to delayed identification of deafness, limited provision of early intervention services, and reduced degree of family involvement (Magnuson, 2000; Moeller, 2000; Yoshinaga-Itano & Apuzzo, 1998; Yoshinaga-Itano et al., 1998; see Kushalnagar, Krull, Hannay, Mehta, Caudle, & Oghalai, 2007).

Prizant and Meyer (1993) and Baltaxe (2001) according to Nicholas and Geers (2006) argue that poor language skills and/or poor parent-child communicative interactions early in life are associated with concurrent socioemotional and behavioral problems.

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“When communication at home is not accessible, the youth experiences a social barrier and has difficulty participating in conversations with their parents. This barrier in the youth’s home environment can result in adverse impacts on the youth’s overall socioemotional well-being” (Kushalnagara, Topolski, Schick, Edwards, Skalicky, & Patrick, 2011, p. 513).

The first three years in a child's life are critical for acquiring information about the world, communicating with family, and developing a cognitive and linguistic foundation from which all further development unfolds. If a child is able to develop age-appropriate spoken language skills, he or she will be more likely to be prepared to enter a preschool or kindergarten setting ready to participate fully in all activities and to engage in meaningful social interactions with teachers and peers (Hart & Risley, 1995; see Nicholas & Geers, 2006).

„The presence of deafness in a family has the potential to affect all areas of family life. An understanding of the impact on family life is critical to addressing all components of the family system in early intervention“ (Jackson, & Turnbull, 2004, p. 15).

Parents who have accepted their children’s differences were more likely to adapt better than parents who experienced emotional struggles in accepting perceived disabilities in their children (Meadow-Orlans, Smith-Gray, & Dyssegaard, 1995; Watson, Henggeler, & Whelan, 1990; see Kushalnagar et al., 2007).

The ability to reframe a situation in a more positive light, finding meaning in the parenting experience, and parent empowerment are associated with positive gain and reduced parental distress (Minnes, Perry, & Weiss, 2015; see Szarkowski, & Brice, 2016).

The research results Hintermair (2006) show that „high parental stress is associated with frequent socioemotional problems in the children, thus emphasizing the importance of a resource-oriented consulting and support strategy in early intervention, because parental access to personal and social resources is associated with significantly lower stress experience. Child development seems to profit enormously from a resource-oriented support concept.“

The research results Ahlert and Greeff (2012) showed that „family time and routines, social support, affirming communication, family hardiness, problem-solving skills, religion, a search for meaning, and acceptance of the child's hearing status were associated with family resilience. Strengthening these elements helps families to grow, meet challenges, and reestablish balance and harmony within the family system.“

Many participants in Reiff et al. (1995) study em-

phasized the importance of emotional support and social connectedness that continued from childhood into adulthood. Participants reported that their parents persevered through external challenges, such as educators' discriminatory behaviors and low expectations. Parents helped instill a value system consisting of proactive lifestyle practices that led to proactive professional and social outcomes for their children (Jacobs, 2010).

The development of a supportive and warm, caring relationship between a parent and a child can be the first step in strengthening students' perceptions of their own abilities and improving their understanding of learning (Marchant, Paulson, & Rothlisberg, 2001; see Sremić and Rijavec, 2010).

Parental support, appropriate educational style and parent involvement, degree of support and control are positive factors in the development of self-esteem, social skills development and competence, motivation and school achievement.

The aim of this paper was to determine the perception of parental support and understanding by deaf and hard-of-hearing students.

METHODS

The sample

The sample consisted of 47 hearing impaired students 30 (63.8%) deaf and 17 (36.2%) of hard-of-hearing students), 24 (51.1%) males and 23 (48.9%) females, average age of 16 ± 1.27 years.

Measuring instrument

The Children's Perceptions of Parents Scale (Grolnick, Ryan, & Deci, 1991) used for the examination consisted of three subscales: perceived parental involvement, perceived parental support to autonomy and perceived parental warmth, especially for the mother, especially for father. The total number of claims pertaining to the mother is 21, and the same for the father as well.

The estimate is done on a Likert-type scale from 1 to 7 (1 - I completely disagree, 7 - I fully agree). Cronbach's alpha coefficient (Cronbach's $\alpha = .87$) showed very good reliability and internal scale approval for this sample. The results of the responses were summarized and the total value was obtained, as the basic statistical sequence for the processing and interpretation of the results, which could amount a minimum of 21 and a maximum of 147 points.

Data analysis

Data was processed in SPSS program for Windows. The data were processed by descriptive analysis, and the t-test was used to test the mother's support perception difference in relation to father's support perception.

RESULTS AND DISCUSSION

Frequencies and responses to individual statements indicate that deaf and hard-of-hearing students mostly positively perceive involvement, autonomy support and mothers warmth (Table 1).

In involvement, they mostly find that mothers find time to talk (91.4%) and spend enough time with them (85.1%), and that they are investing time and energy in helping them (82.9%). About half of them believe that mothers are often too busy to deal with them, and most of them believe that mothers are not much reliant on their concerns (63.9%) and do not think too often about them (76.6%). Students in this case were unlikely to understand that these claims re-

late to the involvement of mothers in their activities, rather than their feelings - emotions, as confirmed by positive responses to mother's warmth claims.

In support of autonomy, deaf and hard-of-hearing students mostly feel that mothers know how they feel (97.2%), allow them to do what they want (61.7%), listen to their opinion and attitude when they have a problem (91.5%), (65.9%), they are ready to look through a children's perspective (78.7%), help them choose their own path (72.3%), but try to determine their way of life (87.3%) and to the smallest extent they think they are not too sensitive to their needs (48.9%) and to insist on doing things in their (mothers) own way (55.2%).

In the case of warmth perceptions, most of them declare that their mothers accept and love them for what they are (97.9%), that they express their love for them (95.7%), make them feel special (85.0%), usually are happy to see them (91.5%), and at the lowest rate they often disagree with them (59.6%) and do not accept their opinion. However, 80.1% of respondents said that they felt that their mother was disappointed in them.

Table 1. Distribution of responses to perception of involvement, support of autonomy and mothers warmth

Perception of mother's support and understanding	1 f(%)	2 f(%)	3 f(%)	4 f(%)	5 f(%)	6 f(%)	7 f(%)
My mother knows how I feel	0(0)	0(0)	3(6.4)	3(6.4)	7(14.9)	11(23.4)	23(48.9)
My mother is trying to tell me how to live my life	1(2.1)	0(0)	0(0)	5(10.6)	11(23.4)	13(27.7)	17(36.2)
My mother finds time to talk to me.	0(0)	2(2.1)	0(0)	1(2.1)	8(17.0)	9(19.1)	26(55.3)
My mother accepts me and loves me for what I am.	0(0)	0(0)	1(2.1)	0(0)	6(12.8)	5(10.6)	35(74.5)
My mother, whenever possible, allows me to do what I want	6(12.8)	4(8.5)	2(4.3)	6(12.8)	11(23.4)	7(14.9)	11(23.4)
My mother does not think of me often	5(10.6)	2(4.3)	2(4.3)	2(4.3)	3(6.4)	12(25.5)	21(44.7)
My mother clearly expresses love for me	0(0)	0(0)	2(4.3)	0(0)	8(17.0)	10(21.3)	27(57.4)
My mother listens to my opinion and attitude when I have a problem	0(0)	2(4.3)	0(0)	2(4.3)	9(19.1)	14(29.8)	20(42.6)
My mother spends a lot of time with me	1(2.1)	1(2.1)	2(4.3)	3(6.4)	17(36.2)	11(23.4)	12(25.5)
My mother makes me feel special	0(0)	0(0)	1(2.1)	6(12.8)	9(19.1)	16(34.0)	15(31.9)
My mother allows me to decide on my own	4(8.5)	5(10.6)	2(4.3)	5(10.6)	11(23.4)	11(23.4)	9(19.1)
My mother often seems to busy to deal with me	3(6.4)	6(12.8)	12(25.5)	2(4.3)	8(17.0)	5(10.6)	11(23.4)
My mother often disagrees with me and does not accept my opinion.	1(2.1)	5(10.6)	7(14.9)	6(12.8)	4(8.5)	10(21.3)	14(29.8)
My mother insists that I do things her way	6(12.8)	3(6.4)	8(17.0)	4(8.5)	9(19.1)	8(17.0)	9(19.1)
My mother is not so concerned about my worries.	3(6.4)	5(10.6)	4(8.5)	5(10.6)	6(12.8)	11(23.4)	13(27.7)
My mother is usually happy to see me	0(0)	2(4.3)	0(0)	2(4.3)	4(8.5)	10(21.3)	29(61.7)
My mother is ready to look at things from my perspective	2(4.3)	3(6.4)	0(0)	5(10.6)	16(34.0)	7(14.9)	14(29.8)
My mother invests time and energy in helping me.	1(2.1)	3(6.4)	0(0)	4(8.5)	9(19.1)	8(17.0)	22(46.8)
My mother helps me choose my own way.	4(8.5)	1(2.1)	0(0)	8(17.0)	10(21.3)	5(10.6)	19(40.4)
It seems to me that my mother is very disappointed in me.	1(2.1)	2(4.3)	1(2.1)	5(10.6)	6(12.8)	4(8.5)	28(59.6)
My mother is not too sensitive to many of my needs.	3(6.4)	9(19.1)	6(12.8)	6(12.8)	3(6.4)	4(8.5)	16(34.0)

The frequency and the percentage of responses to individual claims show that deaf and hard-of-hearing

students mostly perceive the involvement, autonomy support and warmth of their fathers (Table 2).

In involvement, as well as for mothers, mostly but in small percentages, they consider that their fathers find time to talk (74.4%) and spend enough time (68.0%) with them, and that they are investing time and energy in helping them (76.6%). About half of children think that fathers are often too busy to deal with them and that they are not much reliant on their worries and do not often think of them, but the answers are more favorable than for mothers.

In support of autonomy, deaf and hard-of-hearing students find that they (fathers), like mothers, but also at a lower percentage, know how they feel (97.2%), allow them to do what they want (65.9%), listen to their opinion and attitude when they have a problem (65.0%), that they are willing to look through

children's perspective (68.0%), that they help them choose their own way (72.3%), but also try to determine their way of life (70.3%) and, at the smallest percentage, they are not too sensitive to their needs (23.4%) and insist on doing things their way (42.5%). In the case of warmth perceptions, they declare that their fathers accept and love them the way they are (91.4%), that they clearly express their love towards them (78.7%), make them feel special (72.3%), that they are usually happy to see them 89.3%), and at the lowest rate they often disagree with them (31.9%) and do not accept their opinion. However, as with mothers, with a slightly higher percentage (85.1%), the respondents said that they felt that their fathers were very disappointed in them.

Table 2. Distribution of responses to perception of involvement, support of autonomy and fathers warmth

Perception of father's support and understanding	1 f(%)	2 f(%)	3 f(%)	4 f(%)	5 f(%)	6 f(%)	7 f(%)
My father knows how I feel	1(2.1)	1(2.1)	3(6.4)	4(8.5)	7(14.9)	10(21.3)	21(44.7)
My father is trying to tell me how to live my life	2(4.3)	3(6.4)	2(4.3)	7(14.9)	10(21.3)	10(21.3)	13(27.7)
My father finds time to talk to me.	4(8.5)	2(4.3)	3(6.4)	3(6.4)	11(23.4)	9(19.1)	15(31.9)
My father accepts me and loves me for what I am.	0(0)	1(2.1)	2(4.3)	1(2.1)	9(19.1)	5(10.6)	29(61.7)
My father, whenever possible, allows me to do what I want	3(6.4)	9(19.1)	2(4.3)	2(4.3)	14(29.8)	9(19.1)	8(17.0)
My father does not think of me often	5(10.6)	8(17.0)	2(4.3)	4(8.5)	3(6.4)	9(19.1)	16(34.0)
My father clearly expresses love for me	3(6.4)	2(4.3)	1(2.1)	4(8.5)	8(17.0)	13(27.7)	16(34.0)
My father listens to my opinion and attitude when I have a problem	1(2.1)	2(4.3)	3(6.4)	1(2.1)	12(25.5)	12(25.5)	16(34.0)
My father spends a lot of time with me	5(10.6)	4(8.5)	3(6.4)	3(6.4)	12(25.5)	7(14.9)	13(27.7)
My father makes me feel special	2(4.3)	3(6.4)	1(2.1)	7(14.9)	6(12.8)	12(25.5)	16(34.0)
My father allows me to decide on my own	6(12.8)	4(8.5)	6(12.8)	0(0)	15(31.9)	7(14.9)	9(19.1)
My father often seems to busy to deal with me	8(17.0)	7(14.9)	4(8.5)	4(8.5)	12(25.5)	4(8.5)	8(17.0)
My father often disagrees with me and does not accept my opinion.	13(27.7)	7(14.9)	6(12.8)	6(12.8)	10(21.3)	4(8.5)	1(2.1)
My father insists that I do things her way	2(4.3)	7(14.9)	13(27.7)	5(10.6)	5(10.6)	5(10.6)	10(21.3)
My father is not so concerned about my worries.	5(10.6)	4(8.5)	11(23.4)	3(6.4)	4(8.5)	8(17.0)	12(25.5)
My father is usually happy to see me	2(4.3)	1(2.1)	1(2.1)	1(2.1)	6(12.8)	9(19.1)	27(57.4)
My father is ready to look at things from my perspective	5(10.6)	0(0)	1(2.1)	9(19.1)	16(34.0)	5(10.6)	11(23.4)
My father invests time and energy in helping me.	3(6.4)	5(10.6)	0(0)	3(6.4)	10(21.3)	7(14.9)	19(40.4)
My father helps me choose my own way.	6(12.8)	0(0)	2(4.3)	5(10.6)	12(25.5)	8(17.0)	14(29.8)
It seems to me that my father is very disappointed in me.	3(6.4)	1(2.1)	0(0)	3(6.4)	3(6.4)	10(21.3)	27(57.4)
My father is not too sensitive to many of my needs.	21(44.7)	10(21.3)	1(2.1)	4(8.5)	4(8.5)	3(6.4)	4(8.5)

Given the need for early intervention and intensive rehabilitation treatment, the parents of deaf and hard-of-hearing children have been forced to be involved in these processes since the early developmental period, and therefore their support is indispensable, which largely determines their positive perception by children.

Sremić and Rijavec (2010) investigating the interrelationship between perceptions of parental behavior (through perceived parental involvement, support of autonomy and warmth, especially for the mother and especially for the father) and school achievement of

hearing students in seventh and eighth grade, on a sample of 179 students, received results that indicate that the dimensions of parental behavior are significantly associated with all school achievement measures.

A finding by Toscano, McKee and Lepoutre (2002) according to Marschark, Convertino and LaRock (2006) similarly found that deaf college students who demonstrated high academic literacy skills tended to have parents who were very involved in their early educations, effective family communication (regardless of mode), and high expectations on the part of their parents.

Sremić and Rijavec (2010) cited researches that have shown great importance to parent involvement, a high level of involvement is associated with competence and motivation for achievement (Pulkkinen, 1982), a positive correlation between parental involvement in school activities and school achievement (Stevenson & Baker, 1987), and on this basis they point out the assumption that children of involved parents feel more competent, have greater self-control and independent academic motivational orientation.

„The study's findings indicate that although parental involvement in their deaf child's school-based education program can positively contribute to academic performance, parental communication skill is a more significant predictor for positive language and academic development. Factors associated with parental involvement, maternal communication, and use of additional services are explored and suggestions are offered to enhance parental involvement and communication skills“ (Calderon, 2000, p. 140).

Suzić's (2005) research on the relationship between parents and students aspiration to school achievement has shown that parents and children have quite different views of the same interpersonal relationship and that what parents think of as help and support are often seen by children as a denial of freedom, control or discipline. The same author states that "aspirations of parents sometimes disturb the interest of their children for school achievement, but it happens that these aspirations help the student's efforts and strengthen their motivation" (Suzić, 2005, p. 369).

Parental aspirations can affect the child's professional self-efficacy and school achievement (Jen-Yi & Li Li, 2011; see Milanović-Dobrota & Radić-Šestić, 2012). By testing differences in the perception of involvement, support of autonomy and warmth of the mothers in relation to the fathers by deaf and hard-of-hearing students, the t-test determined a significant difference ($t = 5.37$; $p = .000$) in favor of the mothers (Table 3).

Table 3. *t*-test difference in perception of parental support and understanding

<i>Perception of parental support and understanding</i>	MIN	MAX	M	SD	<i>t</i>	<i>df</i>	<i>p</i>
Perception of the Mothers	74	139	114.70	15.01	5.37	46	.000
Perception of the Fathers	50	130	103.30	17.82			

When examining parenting styles of support, researchers often used children's parent perceptions. The results have shown that mothers are more perceived as supportive than fathers (Grolnick, Ryan, & Deci, 1991). Bodner-Johnson (1986, see Marschark, Convertino, & Larock, 2006) investigated family factors in deaf students' academic achievement. Through interviews with parents, she identified two significant predictors: acceptance of the child's hearing loss (including a positive view of the Deaf community) and high expectations for their children.

Acceptance may also be a cause of poorer support and understanding of fathers. However, practice has also shown that the father most often takes care of the existence and the mother of a continuous rehabilitation-education process, which in the end can affect father's inferior involvement, and thus lead to poorer parent support for autonomy and warmth.

A study exploring paternal-child characteristics indicated that the father's resistance to accepting deafness was associated with poor language outcomes in the deaf child (Hadadian & Rose, 1991; see Kushalnagar et al., 2007, p. 337)

In order to prevent or alleviate the developmental difficulties of deaf and hard-of-hearing children, adequate approach within the family is necessary as well as in

the choice of communication system with the child and in the acceptance of the child. From the early age of parent-child interaction, children begin to perceive themselves and others. The parent should be based on the development of potential in the child, not on its weaknesses and difficulties. Emotional support and social approval by the parents is essential to building an image of oneself, forming interests, wishes, attitudes, goals, which together affects children's perception of their own opportunities and ways to face challenges.

CONCLUSION

Taking into account the need for early intervention, the parents of deaf and hard-of-hearing children have been forced to be involved in this process since the early developmental period. Their support is indispensable which, to the greatest extent by these students in this research, determines a positive perception of involvement, support of autonomy and warmth of both parents. The obtained differences in a more positive perception of mothers, as compared to their father, appear to be objective and realistic since practice has shown that the father most often takes care of the existence and the mother of a continuous rehabilitation-education process.

In order to prevent or alleviate the difficulties of any kind, a deaf and hard-of-hearing child should have adequate approach within the family, both in choosing a communication system with a child and in accepting a child. In a parent-child interaction, children begin to perceive themselves and others. The parent should base his/her involvement on developing and improving the potential of the child, not its weaknesses and difficulties. It is essential for parental support and understanding to be more focused on involving the student in appropriate activities and relegating the set goals and tasks in them. Emotional sympathy and social stimulation must be an integral part of parents' support for the deaf and hard-of-hearing child to build up a better image of themselves, forming interests, desires, attitudes, goals, and thus having a positive perception of their own potential and facing various challenges.

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MATHEMATICAL CHARACTERISTICS OF THE CHILDREN THAT SHOWN ABOVE/BELOW AVERAGE SUCCESS AT THE MATHEMATICAL EDUCATION

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ABSTRACT

In this study, we analyzed the emotional and conative characteristics of fourth grade students of elementary school as follows: motivation for learning math, situational interest in learning mathematics during teaching, mathematics anxiety, self-esteem in relation to academic achievement and attributions of success and failure in mathematics. In a sample of 200 students and 20 teachers were analyzed emotional and conative characteristics capable of above-average and below average in math-age students. The study used the descriptive method, a questionnaire and a test. The research results are presented graphically and in tabular form with an explanation and discussion. In the conclusion are set the directions which should further improve this insufficiently studied area.

Keywords: *mathematics, giftedness, emotional and conative characteristics, teaching, teacher, student*

INTRODUCTION

By mentioning above average most of the people think about the high intelligence children, or the children that are above average at arts, physical activities and similar. Development of above averegness is a consequence of interaction between inside factors (cognitive and coactive) and outside social factors. In other words high intelligence children undubtly possess potential for succes at various activities, but will this

factor develop, and will the child make above average sucess at one or more of thi areas depend on other inner and outer factors. Most mentioned inner factor is motivation, self anxiety, system of values, interest, controle place, temperament, and similar (Joswig, 1994). Modern reasearch proves that this factors are responsible not only for differences at succes between above average, and below average children, but also for differences in the set of above average ones.

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We usually conclude that the children that possess above average intelligence are meant to be high graded at school and out of it. But the researches from psychology of motivation and the researches on the sets of high intelligence children show distinct results (Cudina-Obrovic, 1991). High intelligence children undoubtedly possess potential for success in various activities. But will this potential develop and will the child make above average results in certain areas depends on distinct inner and outer factors. The most important outer factors are activities by environment (primary from family and school), which means will the child get a chance to show what he/she can do. The most mentioned inner factors are motivation, self anxiety, persistence, construction of values, interest, place of control, temperament and similar (Joswig, 1994). The research shows that these factors are responsible not only for the differences between success at above average and below average children, but also for the differences between the members of the set of above averages. Specific set inside the set of above average make are the children with the gift for mathematics. These are children that beside above average general intelligence make above average results at the tests of mathematical abilities. These are the children which during the socialization process develop precise interest for mathematics, and realised it using a leap of above average abilities, and probably subtle effects of environment. All of this resulted with high success of solving mathematical problems, especially those which requires high rate of cognitive functioning. It is well known that the children that due to intellectual abilities can be separated even at pre school age, but inquested is at what age is possible to see the difference between the children with and without gift, observing their conative characteristics? In other words one of the fundamental questions at this area is when the abilities of above average children become visible? Are they visible already at pre school and younger school age or they become obvious after this age? Related with this inquested is are these abilities visible at the same areas at the same age? Since the most of research at mathematics area observes post age childrens, at this research we want to check is there a difference at ten years old mathematics above average students and their average colleagues at some emotional and conative abilities. Generally for identification above average children we use following sources of information: measuring scale and lists for checking, distinct kinds of standardized tests, and teachers remark. Since the most of research observes the older children, at this research we will check if ten years old above average students differ

from their below average colleagues at some emotional and conative abilities. The topic of this work will be ***“Mathematical characteristics of the children that shows above/below average success at the mathematical education”***.

Visible shapes of gift

Besides distinct understanding and definitions of gift important are the names which sometimes denote clear differences at the term of gift. Here we will explain their meaning in the light of previous analysis of giftness.

A child with a gift at the behaviour shows the signs of ability of creator. There are a lot of signs, and often are visible at very young age, mostly show the presence of high intellectual abilities (advantage at studying, memory, humor sense, describing sources and connecting it to consequences) or specific abilities: music, arts, psychomotoric or social. Usually from noticing the signs of gift to its manifest at productional-creative shape 10-15 years should pass in intensive educational process and training.

Miracle of child is a special case of a child with a gift. This manifest is explained by »decelage«, which means unequal development of distinct abilities of the child: it is mostly manifested at development and results at one area, while the other aspects of development have a normal tempo. Such psychical development has no negative consequences, while unequal, early or fasten physical development is mostly a sign of some kind of disease conditions. Any single case of »vunderkind« is a result of very rare kind of environment action combination which means, nice connection of specialised inherited dispositions with specific especially accented applicability and sensibility of environment. According to the modern understanding of a gift »child miracle« is not a miracle but only extreme, most visible case of the actions at development of any gifted child: intensive and selected education very developed specific abilities (*examples: J. S. Mills learned classical Greece when three year old; 15-year old has a dozen of patents; 9-year old completely musically educated; student gives a computer lessons to the teachers, etc.*)

Idiot-wise men are also the form of unbalanced and unequal very intensive development of some specific ability. Already as children they show very specialised talents, as an example incredible memory for numbers, dates, ability of fantastic calculations in their head, or memorizing complicated music contests. They mostly show very developed one very narrow ability, while the others abilities are mostly retarded.

American psychologist *Howard Gardner* (1983) claims that idiot wise men are also child miracles, proof that there are specialised neurological areas in the brain which are responsible for certain kind of ability (*examples: retard child Obadia is by itself when six years old learned how to add, subtract, multiply and divide; George with six years could exactly say the day at the week of far away passed year learning the characteristics of eternal calendar; 11-year old memorizes endless series of numbers.*)

Genius is a term that inside the term of gift has two meanings. Both meanings are connected with the understanding of high level of ability.

Inside the psycometric definition of the term »genial« meaning on the people having an intelligence coefficient higher than 160. Nowadays the term of genius at this statistic-psycometric sense is abundant and the term »extremely gifted«, »extremely high gifted«. The other meaning of the term genius also attributes to the persons who during the life time created a huge corpus of creations which have valuable effect to the human mind and a situation. This is understanding of the term genius which coincides with productive-creative giftedness with the accent of the presence especially huge development of motivational-creative completeness of ability. A talent is a term which inside the term of gift has especially undefined use. One of the meanings of the talent is which is nowadays called »manifested giftedness«, for the difference of potential giftedness which is denoted only with the term »giftedness«. In the other meaning »talent« is rated as a bit lower rated degree, and »giftedness« on a higher degree of intellectual giftedness. The newest understanding a term talent is in correlation with multiple definition of giftedness: while high intellectual abilities represent base of general giftedness, till that the abilities which ensure high success in specific areas (arts, sports, social) – base of specific gift or talent. Besides the parents during the development of gift an important role play the educators, teachers, professors, and general characteristics of educational place. While considering the action of teacher in the gift development we should make a difference between the meaning of the word teacher:

1. Teacher as a creator of an atmosphere suitable for the development of a gift,
2. Teacher – parent,
3. Teacher – educator of students with gift,
4. Teacher – mentor.

Pedagogical bases of the work with mathematics gifted students

Quality of work with gifted students at mathematics area depends not only on good knowledge of psychological aspects of work with young mathematicians but also on adoptable use of advanced knowledge of modern pedagogical sciences, certainly quality of a teacher besides very good knowledge of the area he is involved in also includes didactic-methodic ability.

Basic components of good work with gifted students

Initial base for the work with young gifted mathematicians certainly constructs knowing and analysis of all components which follow good planned work with gifted students.

Analysing and combining researches of various researchers Šefket Arslanagić in his works tells about 16 components which create a good work with gifted students:²

1. Quality of mathematical contest considers precise planned topics of work and their inner logical and mathematical connection. Well planned program of work guarantees continuity of realisation of work and expected effects. Mathematical contests are not only simple spreading or deepening school program but also measured materials which contain necessarily enlarged level, and are directed to adopting necessary knowledge and forming exactly planned logical functions.
2. Right pedagogical access is necessary, since any improvisation would be negation of the work with students with gift. Forms and methods of work with students with gift have to be an object of careful observation and as distinct as possible. Work with students with gift is interactive process during which students effect their teachers.
3. Teacher ability as one of the most important factors at the work with students with mathematics gift. Teacher plans and makes a program for work, prepares materials, recommends literature, organizes a lesson, identifies students with gift, motivates and leads. He is the one who has to have excellent knowledge of mathematical contents, but also a good methodist, properly instructed in pedagogical and psychological base of education and additional work with the students with gift.

²dr Šefket Arslanagić: Aspects of math teaching for gifted students, Association of mathematicians BiH, Sarajevo, 2001.

4. Directing to the problem solving and application is one of the most important components of the work with gifted mathematicians. Students should be taught to get knowledge, to solve a problem, and then those explorations and knowledge apply in practice.
5. Good communication skill is necessary for mathematics learning. From gifted students expectations are to read and write, speak and think as mathematicians. Condition for that is good communication on the relation teacher-student and student-student. Modern communicational tools are good help for the work and making advantage with gifted students for successful communication.
6. Directing to higher levels of thinking is an important mark at the work with gifted students, and is reflected at constant attempts to direct the work deeper than solving the problem towards new explorations and results.
7. Skill of teaching and work adaptation are an important factor of good work with young mathematicians. Only gift has no great chance if an extraordinary intellectual potential is not followed by suitable working abilities. At the work with gifted we must insist on reading, making data bases, and good organization of studying and responsible relation to the work that has to be done.
8. Individual differences between the students which are identified as gifted is certain. Students need a help to find themselves at the world of great mathematical secrets, also as in daily environment in which people practice arts, sports and other activities.
9. Initialising of creativity is an important characteristic of good work with gifted students. All the students have to get a chance for creative expression. Gifted students have to be constantly forced to show original solutions, to give an idea, to explore and to make experiments.
10. Helping tools for studying, and before all working materials, mathematical magazines and literature, humans as a living helpful tools for studying are necessary followers of the good planned work with gifted. To this group of tools should be added printed media, radio and television as well as the other audio-visual and communicational tools.
11. Planning and development and good coordination in the borders of all working program with gifted students is necessary. Program has to be evolutionary and directed towards unexplored potentials of the gifted students. Process of planning should be set up flexibly, so in the case of need there could be made changes and additions to the plan.
12. Integration of contents should contain inner correlation

as well at mathematical contents but also the contents of other lessons. This correlation has to be manifested at the work with gifted at mathematics as well as the other teaching subjects.

13. Mark of realization working plan with gifted dynamically observed is constant work. Following the student development and efficiency of predicted procedures leads to the faster students upgrade. That is the reason the methods of following should be various.
14. Concern for students is necessary, and teachers, realisers of the program for gifted had to be involved at single needs and the problems of gifted students. Bad thing is if the gifted are directed only to mathematics and if the presence on the other programs is forbidden, because the program for gifted should also protect them from social isolation.
15. Mobility and flexibility of the program contains certain motion necessary for moving any of gifted students in or out planned procedures and activities.

Traditional school versus active school

The aim of topic „traditional school versus active school“ is a confrontation of those two concepts (which in reality certainly is not presented in that measure), through presenting characteristics of one and other school and analysis of the school spirit which slowly should be abundant, and school spirit towards we should move, spirit that is more suitable and gives better chances to the gifted students.

Traditional school works with already prepared defined plans and programs and the aim of teaching activities is adopting the program. Basic method of education is lesson (verbal presenting of knowledge) with temporary use of teaching tools. Student is mostly passive listener and has to memorise, understand, and reproduce given subject. Marking, no matter verbal or by paper exam is constructed by checking the given subject is adopted. Motives for studying are mostly of outer nature (mark, honorable mention, reward, punishment,...). At traditional school child is observed as a student, which means a person who would with understanding at as more as possible manner repeats subject he has heard. Active school is more focused to young man who is treated as a complete personality, whose intellectual needs should be engaged at teaching process as more as possible. Active school is based on educational standards which are used to construct orientational plans and programs of work. Such access considers the part of lesson which is settled flexible and varies depending of students interest, and studying is attached to the students interests. Motivation for studying is personal (inner).

At the lesson dominate active methods of studying which are based on work and intellectual engagement of the students at explorational activities. The aim of active school is not only adopting lesson program but allsided development of personality, and individuality of the student.

Analysing explored characteristics we can conclude that for the work with mathematics gifted students is more acceptable active school and that the concept of work with mathematical talents should be directed to:

- respecting the personality of gifted;
- considering age and intellectual characteristics of gifted;
- spreading repertoars of educational methods for the work with gifted;
- motivation of talented;
- forsing former intellectual development of gifted.

At the mathematics education, especially at the work with gifted at this area this metod is necesarry, since by using litterature no matter at home or at the library or at internet is crucial for qualitative advanced knowledge adopt. Students get the possibility by using textual materials to make progress individually by dinamics conditioned by their own free time and prepareness to use that time rationally and for faster progress at the mathematics area.

Teachers-specialists for the work with talented mathematicians are created and educated. That is why is necesarry to have precise strategy of their identification, following and professional development. By organised work on special didactic-metodic, and metodologic education of those people it is necesarry constantly make a progress at the work with mathematics gifted itself. Teachers that work with gifted students very often are regruted from the set of previous succesful competitors.

METHODS

Aim of reasearch

Aim of reasearch is to confront mathematics above average and below average students of the fourth grade of primary according to the following conactive and emotional characteristics: motivation for mathematics studying, interest for studying during the lesson, mathematical anxiety, selfrespect related with promotion at school and atribute of success and unsuccess at mathematics. Group of mathematical above average students will be identified at the base of teacher judgement, as a problem at the test of mathematics knowledge. The other group will be constructed by the students of an average abilities with no mathematical above average children.

Problems of reasearch

- Confirm if the mathematical above average children have a greater motivation for studying then below average students.
- Confirm if the mathematical above average students have greater selfrespect then the below average students.
- Confirm if the mathematical above average students accept more easily unsuccess then the below average students.

Main hypotesis

Check if ten years old mathematical above average differ by some conactive and emotional abilities from their below average colegues.

Subhypotesis:

- We suppose there is a difference at conactive characteristics between above average and below average students.
- We suppose there is a difference at emotional characteristics between above average and below average students.
- We suppose that mathematics above average students have a greater motivation for studying then their below average colegues.

Sample of reasearch

In the process of choosing samples we will apply sutible action-testing of students which ensures that the sample is sufficiently large and homogenius as well as representative.

Students above average wil mark the teachers from the scale PROFNAD (Koren, 1989). On the fundament of high results at numerical test will be chosen the students which are requested by the test of knowledge from mathematics, constructed specially for this purpose. And finally at the group of above average the students with the best knowledge test results will be inserted. Criterion for choosing the children in other group will be those which at numerical test didnt show succes more distanced from an average more than one standard deviation in the direction of better results. Population at this reasearch are the students of primary school of the Travnik area, as a sample we have primary school fourth graders of primary school "Turbe".

Methods and research technics

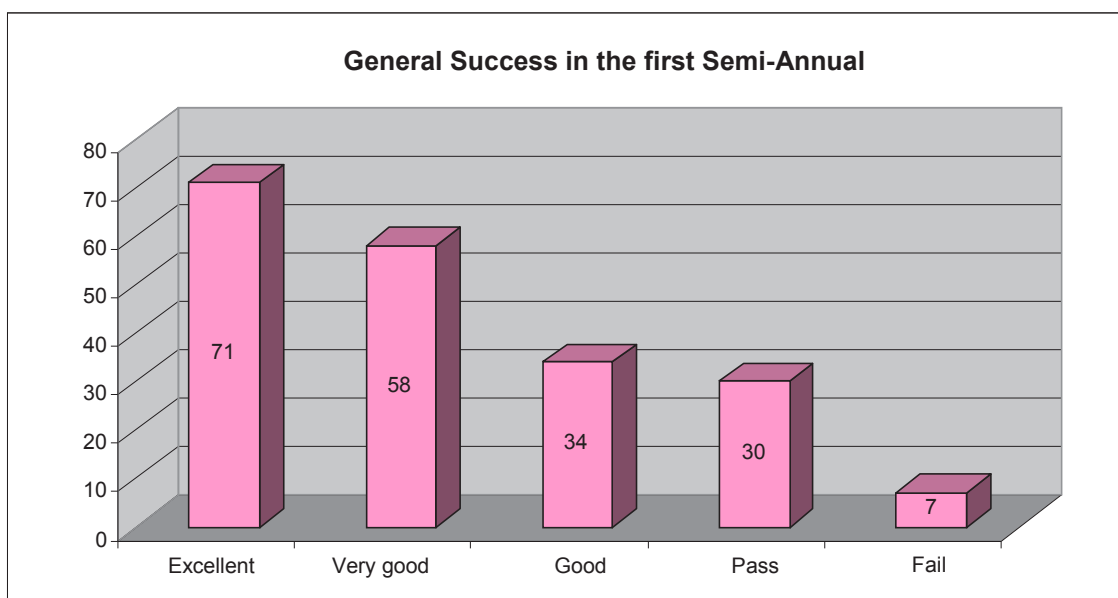
At the reasearch we will use analytic-descriptive method, methof of theoretical analysis (studying of school documentatiton, which means student success). Reasearch technics which will be used at this work are: testing, question mark for students, and scaling as well as statistical data observation.

Calendars and a way of reasearch

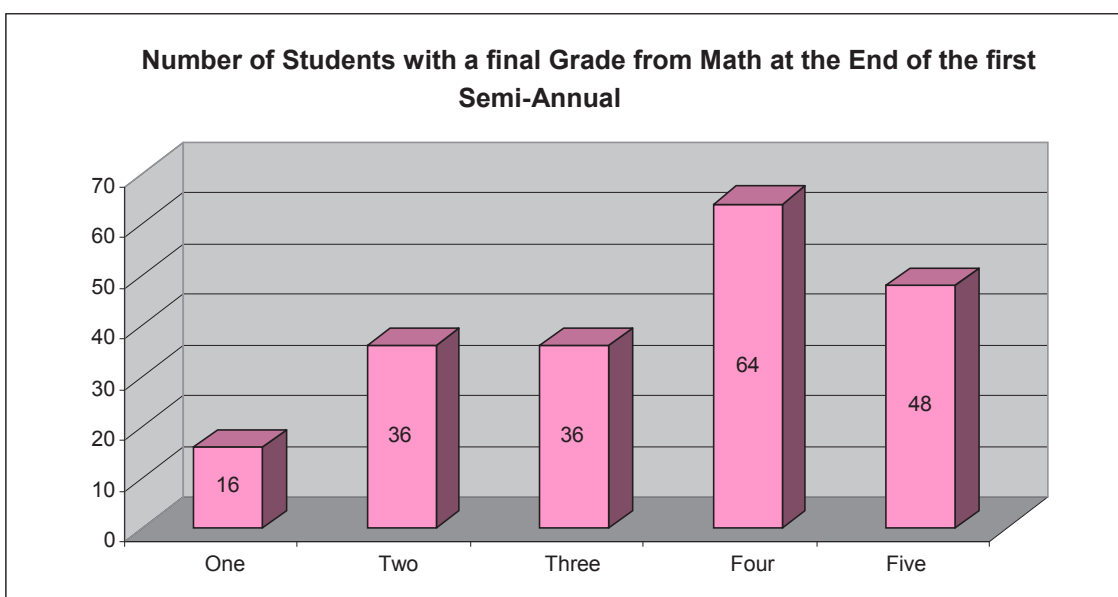
Reasearch is done in the second halfyear of 2014/15 at primary school „Turbe“. We have visited the school talked to director and pedagogist and teachers of the school so the way of executing the program could be explained, meaning students testing, and inportance of the reasearch itself.

RESULTS

In this chapter are analised and interpreted the results we have got from reasearch of given topic. The ways of shown results are table grafic and textually in the way of explanation. The reasearch is done in the period 1-13 march 2015 year. Reasearch includes 220 members, 200 of them are students and 20 teachers. At all the number of members 97 were man and 103 women. Students from choosen sample fulfilled an an-kete which tested giftnes of the students, as well as emotional and conactive characteristics. On the following two graphs are shown classification of total number of tested students on the base of an average succes at the end of the first halfyear, as well as on the basis of an average mathematics mark.



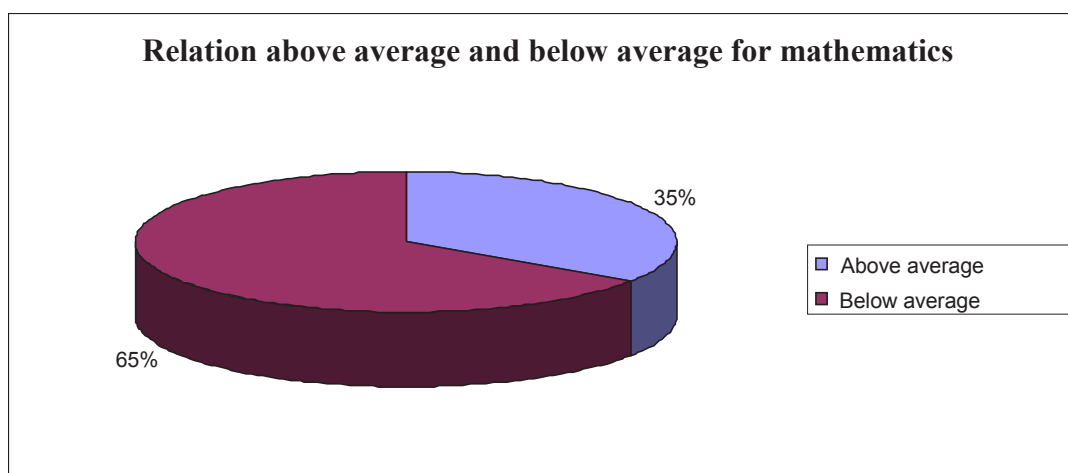
Graph 1. Classification of students on the base of success at the first halfyear



Graph 2. Classification of students on the base of mathematics mark

Analysing data we have got from previous graphic number of students at mentioned two schools which ended the first halfyear with grade 5 is 71 or 35.5% of total number of students in research, grade 4 got 58 students or 29%, grade 3 got 34 students or 17%, grade 2 got 30 students or 15%, and 7 of the students at the end got a grade 1 or 3.5% of total number of students at research. An average general mark of the chosen sample at the end of the first half year was 3.804. Analysing the data from the other graphic number of students which ended first halfyear with grade 5 is 48 or 24%, mark 4 has got 64 or 32% students, grade 3, 36 or 18% students, grade 2, 36 or 18% of students and 16 students ended first halfyear with grade 1 or 8% of total number of students. An average mathematics mark of the chosen sample at the end of the first halfyear was 3.64. We can conclude that the average

mathematics mark is lower then the general mark on the chosen sample for 4%. On the base of filled ankete and marking correct answers students from mathematics as on the base teacher judgement students are divided into two groups: above average able and below average able for mathematics. Criteria for choosing the children that will be at above average group is the result they showed at numerical test, the results that are distant for a half of standard deviation from the average mark in the direction of better results. Above average for mathematics is 69 students or 34.5% from the chosen sample, while below average students number is 131 or 65.5% of the sample. Aproximety is the same number of boys and girls at the shown structures, so we can conclude that the genre is not effectible to it. Relation of above average and below average for mathematics is shown on the following graph.



Graph 3. Relation above average and below average for mathematics

Motivation for mathematics studying

Motivation is an important factor of succesful studying. Motivated student makes much beter progress at studying then the student which is not motivated. There are various motives which force students to study mathematics, like, interest in mathematics, desire to show personal value, desire for constant spreading of mathematical knowledge, promised reward or punishment, desire to get a beter mark, wish to get to the solution of the certain problem, cocesnes to about need of mathematics studying, need to help the others, good teacher that motivates the students to learn the mathematics, etc.

At the chosen sample we confronted motivation for mathematics studying of above average and below average students of the fourth grade. Special anket is prepared for teachers who graded from 1 to 5 certain claims related to motivation above average and the motivation of below average students. Marking total motivation of the students for mathematics studying at above average group of students following results are got. The mark is an important motiv for above average, but besides the marq equally or even more motivating are teachers mentions, desire for spreading mathematical knowledge, desire to show personal value. In the next tables are the answers of teachers.

Table 1. Motivation of above averages for mathematics

ABOVE AVERAGE FOR MATHEMATICS				
Need to help the others is an important motiv				
1	2	3	4	5
		4	12	3
Better mark is an important motiv				
1	2	3	4	5
		4	10	6
Teachers mentions are important motiv				
1	2	3	4	5
		2	7	11
Desire to show own personality is an important motiv				
1	2	3	4	5
		5	6	9
Desire for spreading mathematical knowledge is an important motiv				
1	2	3	4	5
		6	6	8
Total mark of motivating for mathematics				
1	2	3	4	5
		1	9	10

Table 2. Motivation below average for mathematics

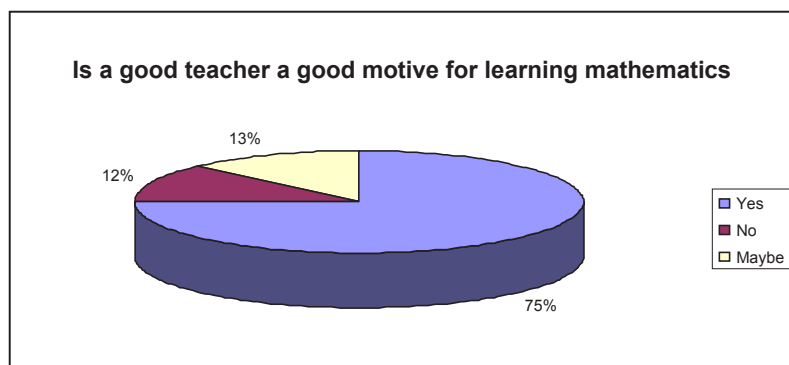
BELOW AVERAGE FOR MATHEMATICS				
Need to help the others is an important motiv				
1	2	3	4	5
4	7	9		
Better mark is an important motiv				
1	2	3	4	5
		6	9	5
Teachers mentions are important motiv				
1	2	3	4	5
3	8	7	2	
Desire to show own personality is an important motiv				
1	2	3	4	5
4	7	7	3	
Desire for spreading mathematical knowledge is an important motiv				
1	2	3	4	5
4	6	8	2	
Total mark of motivating for mathematics				
1	2	3	4	5
	5	13	2	

On the base of visible results we can conclude there is a huge difference in motivation for studying mathematics of above average and below average mathematicians. General mark of above average mathematicians is 4.45, while the same one of below average mathematicians is 2.85. This confirms the hypothesis that above average students have a greater

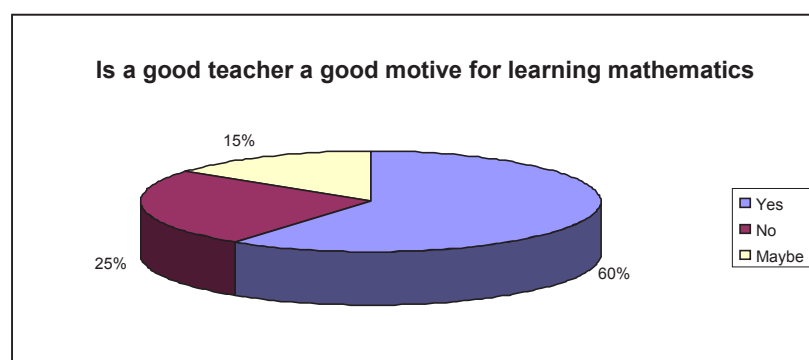
motivation for studying mathematics than the below average.

On the question Is a good teacher good motiv for studying mathematics ?

Above average students gave the answer shown on following graphic *Graph 4.*, while the answers of below average students are shown on *Graph 5.*



Graph 4. Answers of above average students



Graph 5. Answers of below average students

Using shown results we can see that good teacher can affect the students to learn mathematics. Obviously is also there is a difference between above average and below average students. Student needs to be effected to study because of their own progress, and preparation for life. Student must not be „foreign body“ in the process of education but has to be integrated in that process. Has to be involved in it from programming across showing and checking all to the giving value to the work. Student should be motivated to study such that outer effects are demanded by inner. On the base of collected data from our ankete we conclude that the problem for high grade mostly motivates the student for studying mathematics. Obviously it comes out from nowadays social reality ,and that the psykosocial motivs are the greatest factors studying and work, which tells also about educational aspect motivation of the student. Motivation of the student is socially conditioned, and motivating depends on living of educational contents. Motivation of the student depends on position and tretman of a men at given social time and its contradictionaries. Nowadays at our area knowledge is less then valuable, but social position and the ability for getting material things is very valuable. Needs are to get a position, to be rich and powerful. Knowledge is not necessary at this area yet, at least it is not visible and sesible. Can and must the

society be satysfied by that? Certainly no. Basic potential for development and progress of any society are young men. We should maximally posibly support their development and education. To succed at this area we should support the education of the teachers, their social place and inportance. We should let them know we appriciate their hard work. They should be rewarded according to their work and the inportance of that work on the future of all society ,and not to force them that in apsence of subjects for life become corrupted as it has happend at most of other areas.

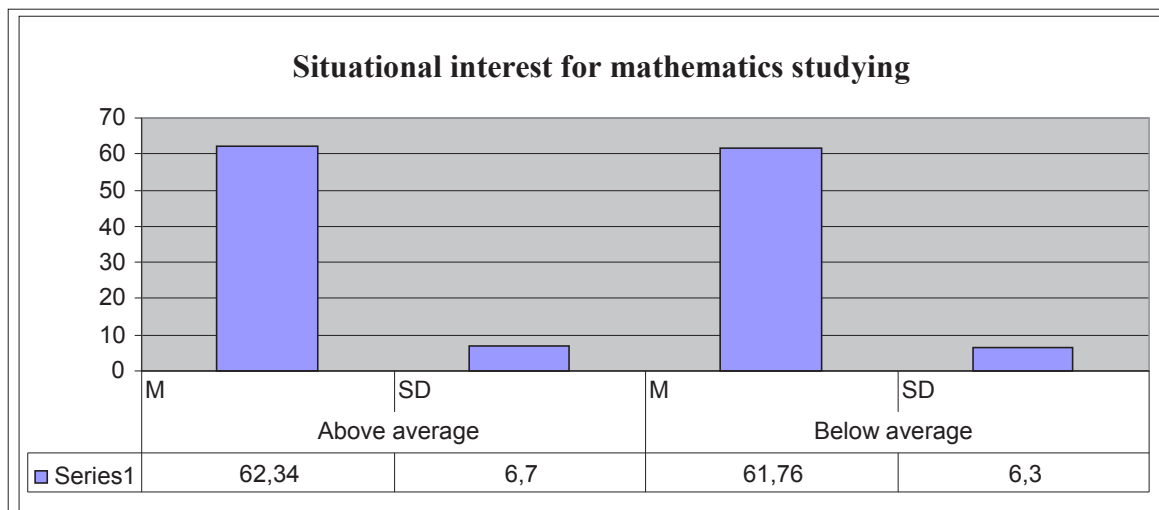
Situational interest for mathematics studying

Students interest for mathematics and natural sciences is important effect to motivation of the student and has also positive effects to studying, understanding of natural-scientific contents. Personal and situational interest creates an optimal conditions for studying. Students interest begins and develops by interaction of the students and enviroment. Enviroment are objects that circumscribe the student or the activities the student is effected by. Student includes in activities if he is interested in topic or effected motivating activities from enviroment. Krapp et al., (1992) introduce two tipes of interest:personal (individual) interest and situational interest.

Personal interest is individual predisposition according to the contents. Situational interest stimulates with educational activities. It is created by certain actions as exploring work, work on experiment, or concrete objects as an interesting movie, text and similar.

For the difference of personal interest which is relatively constant even when the environment is without stimula-

tion, situational interest survives as long as the environment stimulates it. In the class environment situational interest is mostly under the effect of teacher, who can stimulate interest of the students for natural scientific contents in various ways. On the following graph are shown the results of research situational interest at above average and below average mathematicians.



Graph 6. Situational interest for mathematics

On the base of research results variable which also doesn't differ those two groups is a situational interest for mathematics. In other words for both groups of students distinct aspects of studying and teaching at the mathematics lesson are equally interesting even when the topic is solving mathematical problems. Possibly that equal and also very high situational interest for mathematics in both groups of students is a

consequence of ability of our teachers to individualize the lesson and give a support to any single student.

Attributes of success and unsucces at mathematics

We analysed attributes of success and unsucces on the chosen sample of students and we came up with the results shown in the following table.

Table 3. Atribut of success and unsucces

Variable	Above average		Below average	
	M	SD	M	SD
Atributing success				
Ability and personality	4.05	.65	4.09	.80
Aktivty and motivation	3.67	.77	4.1	.75
Outer factors	2.78	1.03	4.3	.97
Atributing unsucces				
Ability and personality	2.05	.92	2.83	1.45
Aktivty and motivation	2.17	1.15	2.78	1.38
Outer factors	1.75	.88	2.89	1.56

Also the students gifted for mathematics at much more measure than the average students attribute their success and unsucces to outer effects, but also improper ability and ability of the person mark as less important for unsucces. But those two groups don't differ much at attributing the success at mathematics to the inner stable factors, which means abilities of personality. This information combined with some other researches (Weiner, 1985) about development attribution of school success at students, in which is confirmed that the children of younger

school age still cannot clearly differ the roles of some inner factors in success. Since that in fourth grade most of the student is capable to learn school subjects at the areas of language, nature and society, mathematics is a school subject at which at that age can survive unsucces. We hold that this fact can explain high connection of some attributes of unsucces with discrimination function. On the other side more visible connecting unsucces to outer reasons at average students could have protecting function, by carrying a feeling of personal value at this area.

But at the same time attributing unsuccessful abilities of personality could be understood as a source latter learned helplessness at the area of mathematics at average students (Weiner, 1985)

CONCLUSION

On the base of the results of research we can conclude that the hypothesis of research is confirmed, that the differences at emotional and cognitive abilities at ten years old above average mathematicians and their colleagues which are below average mathematicians. Above average children undoubtedly possess a potential for success in various activities. But will this potential develop and will the child really be successful at certain areas depends of various inner and outer factors. From outer factors most important are the effects of environment (primary, the family and school), which means to give a chance to the child to show what it can do. From inner factors mostly mentioned are motivation, self anxiety, construction of values etc. (Joswig, 1994). Researches show that this factors are responsible not only for the differences in success between above average and below average but also for the differences inside the group above averages. On the base of ankete students and marks of teachers above average for mathematics are 34.5% and below average are 65.5%. On the fundament of results of analysis single variables it is confirmed that two groups of students best differ following variables: attribution of success to motivation and activity, and outer reasons attribution of unsuccessful abilities of personality and mathematical anxiety. Above average students show greater interest for school work at the mathematic lessons and greater ability to understand mathematics by themselves, and much easier understand the level of their success using their own thinking instead of waiting for return informations. Variable which much differs this two groups is fear from mathematics or mathematical anxiety. Data show that the group of above average much less survives uncomfortable situations, or emotional reactions while confronting the mathematics. An average students actually make weaker success at mathematics, and for their unsuccessful mostly blame outer factors that can't be controlled, and it is logically that the check of knowledge from mathematics except much harder then the above average. Between the groups is not confirmed the difference in variables, attribution of success to abilities of personality, attribution of unsuccessful to activity and motivation, self respect and situational interest for mathematics. Unexistence the difference at

attributions could be partially explained by insufficient systematic differing roles of those factors at mathematical success at that age. Analysis showed that in cognitive variables at this age possible to differ above average and below average mathematicians. The results obtained tell as starting hypothesis of existence of specific construction of motivational correlates manifested giftedness which can be recognized already in young school age. The other relevant evidence tells about that, even an average students at that age possess very good attributional construction, and shown situational interest for mathematics. Since some researches tell how during latter school mathematics becomes as very disgusting subject which creates high anxiety and a sense of learned helplessness, open question about the character and process which leads to such changes. Longitudinal researches at the area of mathematical gift show that stimulation through special educational programs of mathematics and natural sciences gets a big advantages to the high ability. On the other side research informations about an advantage at social adaptation of above average tells that is stimulating family climate main factor of latter academic and professional success of gifted ones.

All of this directs to the need for more exploration of correlates high abilities, especially those at the area of environmental factors. Those researches should show the way to give instrumental, emotional, and social help to the family at the school directed to development of intellectual abilities but also for awakening intrinsic orientation and positive emotions very important for realization a gift of child.

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THE NATURE OF THE CHINESE SCRIPT

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Review scientific paper

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ABSTRACT

This paper introduces the nature of the Chinese script, with the focus on its origin and development, the main four kinds of creation methods, the basic strokes of Chinese characters and the significance of its radical structure. The author believes that Chinese characters are the carriers of the script, phoneme and meaning as well as of the grammatical structure of the Chinese language. Hence, the Latin alphabet for the Chinese phonetic system cannot replace Chinese character, and learning Chinese character is very important for foreign learners. Finally, the author gives a mnemonic of the basic rules for stroke order that facilitates learners' memory and helps them write characters correctly and quickly.

Key Words: *Chinese script, characters, strokes order, Chinese language*

Script is the essence of the Chinese language. For centuries, it has stored in itself what is most precious in the Chinese civilization, culture and literature. In addition, the Chinese script acts as the connective tissue between the many peoples who live on the territory of PR China.

In the long history of the development of the Chinese script, there were periods when up to 60,000 characters were in use. Of course, if we eliminate the alternative written forms of characters for the same word, and if we exclude the ones already “dead”, i.e. no longer used, today there are around ten to twenty thousand characters in constant use. Over the centuries, Chinese characters evolved not only in their form, but also in their meaning, pronunciation and usage. What we can say with certainty is that it is much more difficult to identify their pronunciation

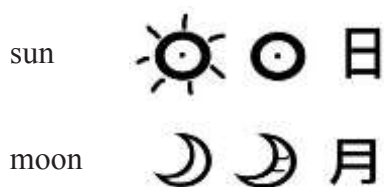
than to discern their meanings or patterns of usage in the ancient times of Chinese history. Namely, one and the same character was pronounced differently in different periods of history, and today we encounter a similar situation in the numerous Chinese dialects. It is therefore very common in China to see Chinese people, who come from areas in which different dialects are spoken, communicate by writing out characters, as none of them speaks “Mandarin Chinese”, or the so-called *Putonghua* standard spoken language.

Most Chinese characters are formed in one of the four following ways:

First, there are pictographic characters (*xiàngxíngzì*) which make up about 5% of the total number of characters. With their stylized forms they directly point at objects and numerous other phenomena of the world.

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The second are indicative characters (zhǐyì) which express an abstract meaning through symbols. Not many characters belong to this category.



Associative compounds (huìyì) form the third category. This type of characters is the result of the combination of two or more elements, which creates new characters with new meanings.

light 明

good 好

The fourth category, to which most characters belong, are the pictophonetic characters (xíngshēng); they make up over 80% of the total number of characters. In their structure, they have a pictographic element which points at the meaning and the phonetic element which directly refers to the pronunciation. E.g.:

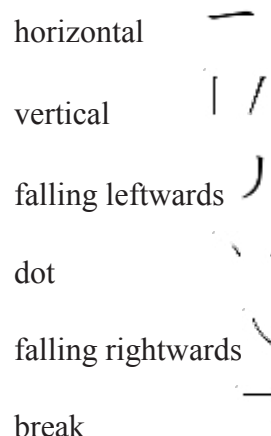
mom 妈妈

river 河

From the above examples, it is not hard to conclude that characters, however complicated in their writing, are rather simple when it comes to recognizing their meaning.

Chinese characters are “compounds” of strokes. Strokes form basic components which are constituent parts of characters. There are 540 basic components in total, and the difficulties in the computer processing of information in Chinese are significantly reduced thanks to them.

Thus the ancient Chinese script with its five-thousand-year-long history smoothly entered the E-age. Let us take a look at the basic strokes in the Chinese script:



There are about thirty types of strokes in total, which are organized on the basis of the above basic strokes. Simplified Chinese characters have about ten strokes on average, whereas characters of a more complex structure consist of around twenty-five strokes. According to the place of components in their structure, Chinese characters are divided into four groups:

1. characters with an independent structure (3%), which consist of a single component. Such characters are: 女、子
2. characters with a left-right structure (65%), two basic components are on the left and right side respectively. Such characters are: 汉、好
3. characters with a top-bottom structure (23%), two basic components are in the top and the bottom part of the character respectively. Such characters are: 学、字
4. characters with an enclosed structure (9%), two basic components are in the outer and the inner part of the character respectively. Such characters are: 国、回.

When writing characters, it is necessary to follow the correct stroke order. This is important for a number of reasons, since on the one hand the right order of strokes helps us write characters correctly and quickly, and on the other facilitates searching for unfamiliar characters in a dictionary.

Stroke Order Song

From left to right go,
From top to bottom flow,
Heng before shu,
Na after pie,
First in the centre write,
Then add strokes on either side.

First the upper, then the lower part.
First to the left and then to the right.
First the outside and then the inside,
Finally close, you've done it quite right.
Learn the order of strokes by heart
And write characters well from the start.

The Chinese language is one of the few languages whose phonetic system² is completely independent of its script. Even though we can sometimes have a vague idea of the pronunciation of a pictophonetic character, we will still not be able to know precisely how to read it, even less to determine the tone in which it is pronounced. This is also one of the particular difficulties in learning the Chinese language³. It is interesting that the Romanization system⁴ for the Chinese language was first “devised” by foreigners⁵. The Romanization system in use today was proposed by the Committee for Language Reform and verified by the Chinese National People's Congress in 1958. Since its adoption as the international standard (ISO 7098) in 1982, it has been used worldwide as the standard form for Chinese transcription. However, we have to bear in mind that the Chinese phonetic alphabet is only a tool and aid in the pronunciation of Chinese characters

That is, Romanization is only a system of symbols for the representation of speech sounds; it is not an alphabetic script (an all-phonemic language). Therefore, it can in no way be a substitute for the Chinese script. During the history of the modernization of the Chinese language, campaigns for the “Romanization of the Chinese script” were organized with the aim to simplify the script in order to reduce illiteracy. Luckily, however, in the 1980s, the Chinese government took the stance that it is important to maintain the continuity and stability of the language and gave up the plan for the complete “Romanization of the Chinese script”.

As every word and expression in the Chinese language is linked to a Chinese character, it is natural that “composition” as the principal method of forming Chinese characters has also become the principal grammatical means of generating language expressions. The profound significance of Chinese characters in the Chinese language is also evident from the fact that they are the carriers of the script, phoneme and meaning as well as of the grammatical structure of the Chinese language.

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²In the standard Chinese phonetic system (Putonghua), there are twenty-one consonants and thirty-nine vowels, among which six simple vowels. The Chinese language is also a tonal language which has four tones and one neutral tone.

³Sometimes, even if we do not know how to pronounce a certain character, it is still possible, with a little knowledge of the structure of the Chinese script, to “read” its meaning due to its pictorial forms.

⁴That is Pinyin, i.e. the Latin alphabet for the Chinese phonetic system.

⁵In 1605, the Jesuits Matteo Ricci and Lazzaro Cattaneo wrote *Wonders of the Western Script*, the book in which the Romanization of Chinese characters appeared for the first time; later, in 1626, building on Ricci's work and with the help of Chinese assistants, the Frenchman Nicolas Trigault compiled the first Romanization-based Chinese dictionary.

THE INFLUENCE OF CONTRIBUTION ACTIVITIES OF TURKEY ON ECONOMIC DEVELOPMENT OF COUNTRIES IN TRANSITION: *THE CASE OF BOSNIA AND HERZEGOVINA AND KOSOVO ECONOMY*

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ABSTRACT

The aim of this study is to improve the knowledge about the influence of the Republic of Turkey on the economic development of the Western Balkan countries in the period from 2003 to 2014. The analysis of the activities of the Republic of Turkey shows how much they contribute to the national product, that is, they had influence on the diversification of the economy, generate the income and sustainability of a part of the engaged population in Bosnia and Herzegovina and Kosovo. Comparative data of the analyzed countries show that, with oscillatory movements, an increase in total investments of the Republic of Turkey was recorded in the period from 2003 to 2014. From the analyzed period, it is clear that Turkey is pursuing an active economic policy, whose primary objective is to improve economic relations with the Western Balkan countries.

Keywords: Total Investments, Contribution Activities, Turkey, B&H, Kosovo

JEL Codes: F00, F59, O57, Z10, Z18

INTRODUCTION

In the last decade, Turkey's commitment to increasing political, economic and cultural influence on the Western Balkans has been markedly increased. All of this has resulted in discussions among politicians, scientists and journalists about the true goals of the Turkish government led by the Islamic-oriented, conservative AKP. Turkey has begun to apply a decisive diplomatic offensive in the Balkans since the Justice and Development Party (AKP) has been in power. In this direction, former Foreign Minister Ahmet Davutoglu has made a lot of efforts to help resolve the political stalemate in B&H, offered mediation between

Kosovo and Serbia, and initiated various initiatives to resolve the existing problems between the countries in that region. In his opinion, the basis of the "political influence of the Republic of Turkey on Balkan are Muslim communities, the heirs of the failed Ottoman Empire" (Davutoglu, 2014, p. 134). In order to achieve its goals, Turkey must conduct a proactive policy in the Balkans regarding the problems concerning the future of Muslim communities in this region. As further emphasizes, in countries where Muslims - the natural allies of Turkey - in most (B&H and Albania), the will appeared to turn this historical connection into a natural alliance (2014, p. 134), which the author considers to be Turkey's strategic interest.

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The growing Turkish influence, however, does not remain solely in the political field. With its growing economy, Turkey has become a magnet for people from the Balkans. Trade and tourism bloom, Turkish soap operas have become very popular on small screens in most Balkan countries, and Turkish universities have become an alternative to young people by offering them attractive scholarships. Jashari (2016) believe that Turkey's interest in the Western Balkans was constantly present in Turkish diplomacy, but also for the Balkan rulers, Ankara has always been a place of visiting and strengthening economic, political and military co-operation. However, the authors consider that the significant engagement of the Turkish film industry in the Western Balkan countries is present not only in places where the population is Islamic, but also in Croatia and Serbia (2016, p. 2).

But despite the positive, first of all economic aspects, many still look with suspicion on Turkey's new policy towards the Balkans. According to Erhan Türbedar, Balkan experts at the Turkish Foundation for Economic and Political Research (TEPAV), many people in the Western Balkans think that the main goal of the Turkish government is to strengthen ties with the Islamic world or that Turkey seeks to achieve its goal through cultural, political or economic funds. In his view, suspicion is based on the past, and the lack of information in the media on Turkish progress contributes to even more stereotypes (Simsek & Martinovic, 2012). However, in order to suppress such attitudes, it is necessary at least to achieve a certain degree of historical objectivity. For example, in the foreword to his book, "Kosovo - A Short History," Noel Malcolm points out that his goal was not anti-Serbian but anti-myth. As further states, one day, all groups, that is, the Serbs, will have to reconcile themselves with their history (Malcolm, 1998: XXVII). Drawing on this and similar opinions, it should be emphasized that the analysis of Turkish foreign policy in the Western Balkan region requires a scientific approach rather than a conspicuous and xenophobic premise of some theoreticians whose academic engagement is related to certain political structures. For now, Turkish ambitions in the Balkans are limited by the fact that most of the Western Balkan population sees Turkey as a medieval occupier of these areas. Certainly, the Western Balkans is important for Turkish interests, but nevertheless significantly less than speculating in the public. In addition, it should be emphasized that Turkey has the economic potential to play a greater role in the Western Balkans, but at the same time is aware of the impossibility to undermine the influence of the EU in the current constellations.

LITERATURE REVIEW

There are two interpretations of the Turkish presence in the Balkans. Some analysts define Turkey as a country that pretends to be regional in power and constantly increases its economic power, while others believe that Turkey follows neo-Ottoman politics. In this context, arguments include historical and cultural links with the region, and the ambition of Turkey to perform independently of the West.

Former Prime Minister of the Republic of Turkey, Academician Ahmet Davutoğlu, in his book "Strategic Depth" (2001) states that Turkish influence in the Balkans is not neo-ottomanism. Due to its historical ties, geographical position and Islamic heritage, Turkey, in his view, has the right to actively act and design political, cultural and ethnic relations in the Balkans. In the same book Davutoglu puts emphasis on the Turkish potential of soft power based on active diplomatic efforts, regional cooperation and economic engagement in its many historical and cultural relations (Baran, 2010, p. 117). According to Davutoğlu, the new doctrine of Turkish foreign policy is a renewal of Turkish influence in areas that once represented a part of the Ottoman Empire. They divide Davutoğlu into three concentric geopolitical circuits. In the "inner circle", Kosovo, Albania and Macedonia, in the "central circle" are B&H, Serbia, Greece and Bulgaria, while the "outer circle" is Croatia, Hungary and Romania. In addition, a strong Albania, a centralized B&H and an independent Kosovo is extremely important for Turkey, because only this can confront the influence of other powers in the region.

However, Turkey's influence is not well accepted by Europe, as confirmed by Edward Said (1999). In his view, these relationships represent an academic problem. Namely, many authors consider Davutoğlu's book as the starting point for neo-ottomanism by promoting many strategies for improving relations with the Balkans and the Middle East. Similar opinion is represented by the deputy leader of the leading opposition Republican People's Party (CHP) Faruk Loğoglu who points out that the Balkan policy of the AKP government has two main dimensions. The first is neo-ottomanism, and the second dimension is the religion-based approach. Members of this party oppose such a strategy by advocating for an approach based on the principles and values of social democracy. However, Turkish politicians in power deny these allegations. In this context, Turkish diplomat Hasan Gogus tells DW that Turkey has built ties with the Balkan countries through a common history, and that claims on a hidden neo-ottomanism agenda are not true (Simsek & Martinovic, 2012).

Also, most analysts believe that the new foreign policy of the Republic of Turkey is based on this ideology. A specific assessment of the relations between Turkey and the Western Balkans was formulated by Dr. Nevenka Jeftić-Šarčević, who says that this region is a mutually contradictory and unintegrated area of the Balkans, which Turkey sees as a group of weakest links and the place in which it can best influence as a bearer of stability and progress (2010, p. 707). She says she is prof. dr. Ahmet Davutoglu chose Sarajevo to present the components of his book, "Strategic Depth", because, in his opinion, Sarajevo is a miniature of Ottoman heritage and Ottoman civilization, as well as a prototype of the rise of the Balkans. Jeftić-Šarčević further concludes that it follows from this that B&H is one of the main strongholds on the way of returning Turkish influence to the Western Balkans (2010, p. 708). In this context, at the opening of the conference in Sarajevo entitled "The Ottoman Heritage and the Muslim Community of the Balkans Today", Davutoglu reminds that there are more Bosnians living in Turkey than in Bosnia and Albanians than in Albania, because, in his opinion, Ottoman heritage (Milos & Landeka, 2009). According to the words of the late Turkish ambassador to Belgrade, Ahmet Umara, 9.5 million people live in Turkey from the Balkans (Rodić, 2010). The conference also said that Turkey will restore the Balkans, in an effort to make the new Balkan region based on political values, economic cooperation and cultural harmony (Milos & Landeka, 2009). In other words, Davutoglu emphasizes that Turkey can no longer be a peripheral state whose political role is reduced to the bridge between civilizations, but must conduct an active foreign policy and become the center of cultural events and political decision-making.

In the book *Strategic Depth* (2014), in which all the more important assumptions of the new Turkish action on the international scene were elaborated in detail, prof. Davutoglu points to the importance of strengthening ties with the Western Balkans, the Middle East and Central Asia, and at the practical level advocates the establishment of a balance in relation to Turkish dependence on the West through the creation of more parallel alliances in the region. He also cites reasons for the importance of the Western Balkans for Turkey. In the first place, the Balkans region represents a geopolitical buffer zone (Buffer Zone) in the passage from Europe to Asia, from Asia to Europe, from the Baltic to the Mediterranean, and even to Africa, from the North to the South, from the East to the

West. At the same time, in his opinion, the Balkans is a region in the geoeconomic sense, as well as a region of geocultural interactions (Šćekić, 2013). According to Davutoglu, Turkey is a gifted country not only because of its geostrategic position and control of key sea routes and the sea, but also because of the historical heritage of the Ottoman Empire, which for centuries ruled large areas on the three continents in which it left its civilization traces.

The doctrine of neo-Mosmanism should have a positive connotation in the contemporary political and economic processes in the world, primarily in the Balkans. In political terms, it contains in its ideological etymology the political space of mutual respect and cooperation, provides opportunities for building its own political image synchronously exposed to the inter-European political project of communion and overcoming all the borders that nations have in the past divided, confronted and distanced from the general, cooperation and the building of a modern world on the planet, free from dictatorships, wars, genocide ... Therefore, Neo-Mosmanism should not be scared and propaganda launched against projects that modern Turkey affirms in the Balkans, the Middle East, the Caucasus ... They are motivated by the work of not conflicts of any kind. That "old" Ottomanism was civilization, while neo-Mosmanism in the EU could be a new, united, economic civilization at the level of global progress.

In concluding this review, we emphasize that societies and leaders interpret history in different ways. Perhaps the most dangerous thing is the conception of history as an obstacle to the future. In the view of academician Davutoglu, the Balkans has the potential to be a model of cultural coexistence that can become an example for other Europeans in resolving the issue of multiculturalism (Davutoglu, 2011). Therefore, historical reminiscences of the linking of the Balkan states of Islamic features cannot be in the function of science, and Turkey will surely additionally strengthen the economic role in B&H, in Kosovo, and in the Balkans in general.

In support of the fact that the new Turkish foreign policy in the Western Balkans can primarily be motivated by economic interests, in the continuation of this study, we present the results of Turkey's weight-bearing influence on the cultural sector in the national economy of B&H and the Republic of Kosovo for a period of ten years (2003-2014). In concluding this review, we emphasize that societies and leaders that interpret history in different ways.

EMPIRICAL DATA AND METHODOLOGY

The influence of the Republic of Turkey on the cultural sector, as well as the impact on the economic development of Bosnia and Herzegovina², i.e. the Republic of Kosovo, contribute to the gross domestic product. The indicator assesses the weight of the Republic of Turkey on the cultural sector in the national economy by comparing the investments of the Republic of Turkey, which include activities for creation, production and distribution of cultural activities, goods and services, as well as the GDP of both countries. The analysis of the activities shows how much they contribute to the national product, i.e. the impact on the diversification of the economy, revenue generation and the sustainability of the part of the engaged population.

The data used to assess the activities of the Republic of Turkey that have contributed to the economic development of B&H and the Republic of Kosovo are:

- World Development Indicators; data downloaded from the website: <http://databank.worldbank.org/>
- Organization for Economic Co-Operation and Development, OECD. Statistic data downloaded from the website: <http://stats.oecd.org/>

Based on the collected data, we compare the total gross value added (GVA) and gross domestic product (GDP), thus providing the opportunity to determine the contribution of cultural activities to the national GDP³.

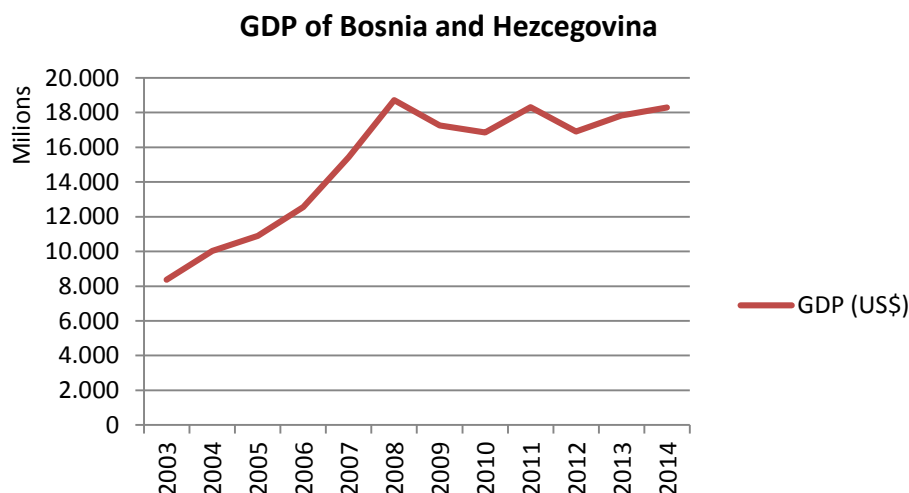
$$\%C_{TR}GDP = \frac{\sum_i^n GVA_i}{GDP}$$

%CTR GDP	percentage of the contribution of the cultural activities of the Republic of Turkey in comparison with GDP
GVA	total investments of the Republic of Turkey in cultural sector
GDP	gross domestic product

Activities contributed to economic development of B&H

Gross domestic product and the impact of cooperation with Turkey

From the data presented for the B&H Gross Domestic Product, in the period from 2003 to 2014, it can be concluded that with oscillatory movements an increase of US \$ 8 million was recorded in 2003 to US \$ 18 million in 2014, an increase by 2.2 times (Graph 1).



Source: World Development Indicators, <http://databank.worldbank.org/>

Graph 1. Graphic presentation of B&H GDP in the period 2003-2014

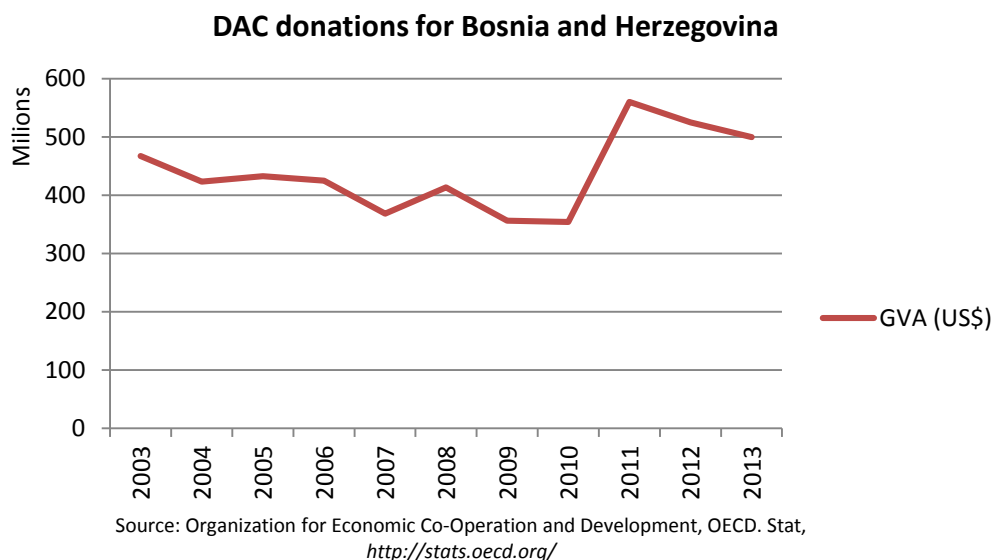
Bilateral assistance from the countries of DAC

According to the available data on the bilateral donor assistance from DAC in B&H in the period between 2003 and 2013, it can be concluded that from 2003

to 2010 the value of the bilateral assistance from the DAC countries was reduced from 480 million US \$ in 2003 to 380 million US \$ in 2010. In 2011, the value of bilateral aid was increased to 580 million, to be again reduced to US \$ 500 million (Graph 2).

²Hereinafter B&H.

³UNESCO Culture for Development Indicators, Methodology Manual, ISBN 978-92-3-001227-4. Data downloaded from the web-side: https://en.unesco.org/creativity/sites/creativity/files/digital-library/CDIS%20Methodology%20Manual_0.pdf (insight: 10/01/2016).

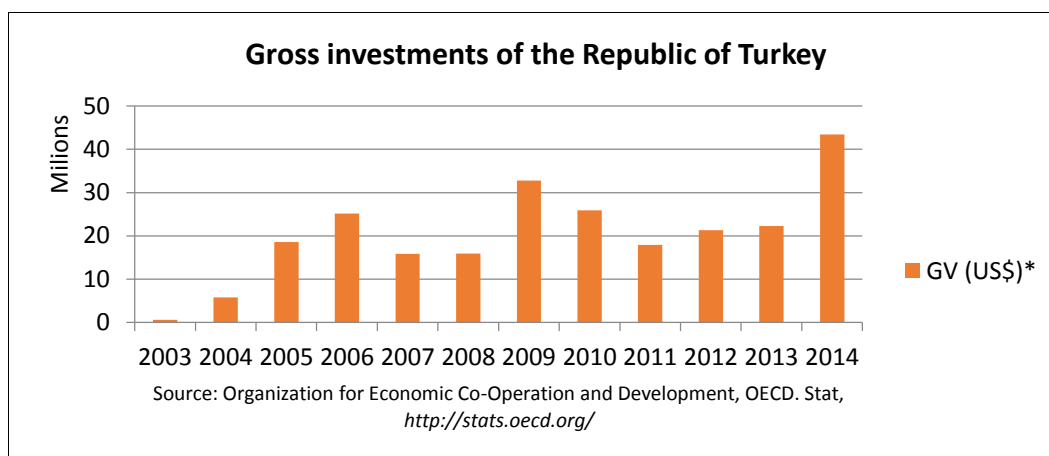


Graph 2. Graphic presentation of donations from DAC funds for B&H in the period 2003-2013

Investments of the Republic of Turkey

In the period from 2003 to 2014, in B&H there was an increase in the gross investments of the Republic

of Turkey, with oscillatory movements. In 2004, they amounted to US \$ 5 million, in 2006 US \$ 25 million, in 2009 US \$ 32 million, while in 2014 they amounted to US \$ 44 million (Graph 3).

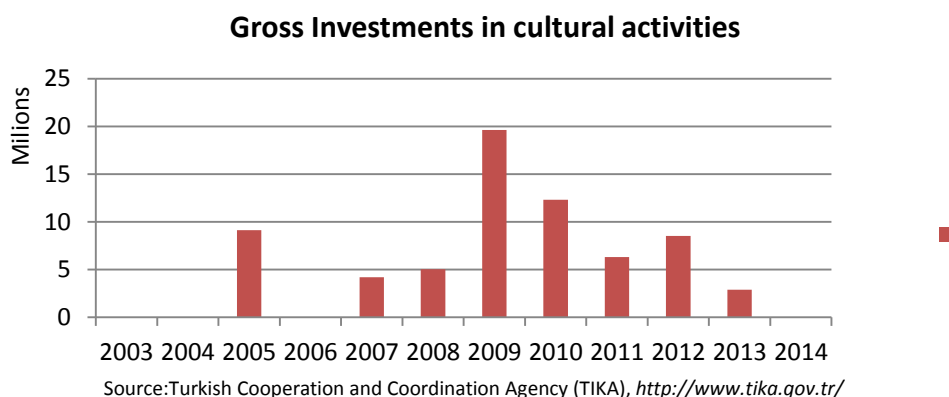


Graph 3. Graphic presentation of the gross investments of the Republic of Turkey in B&H in the period 2003-2014

Investments in the sector culture

In the period from 2005 to 2013, the highest investments in the Bosnian-Herzegovinian sector of culture

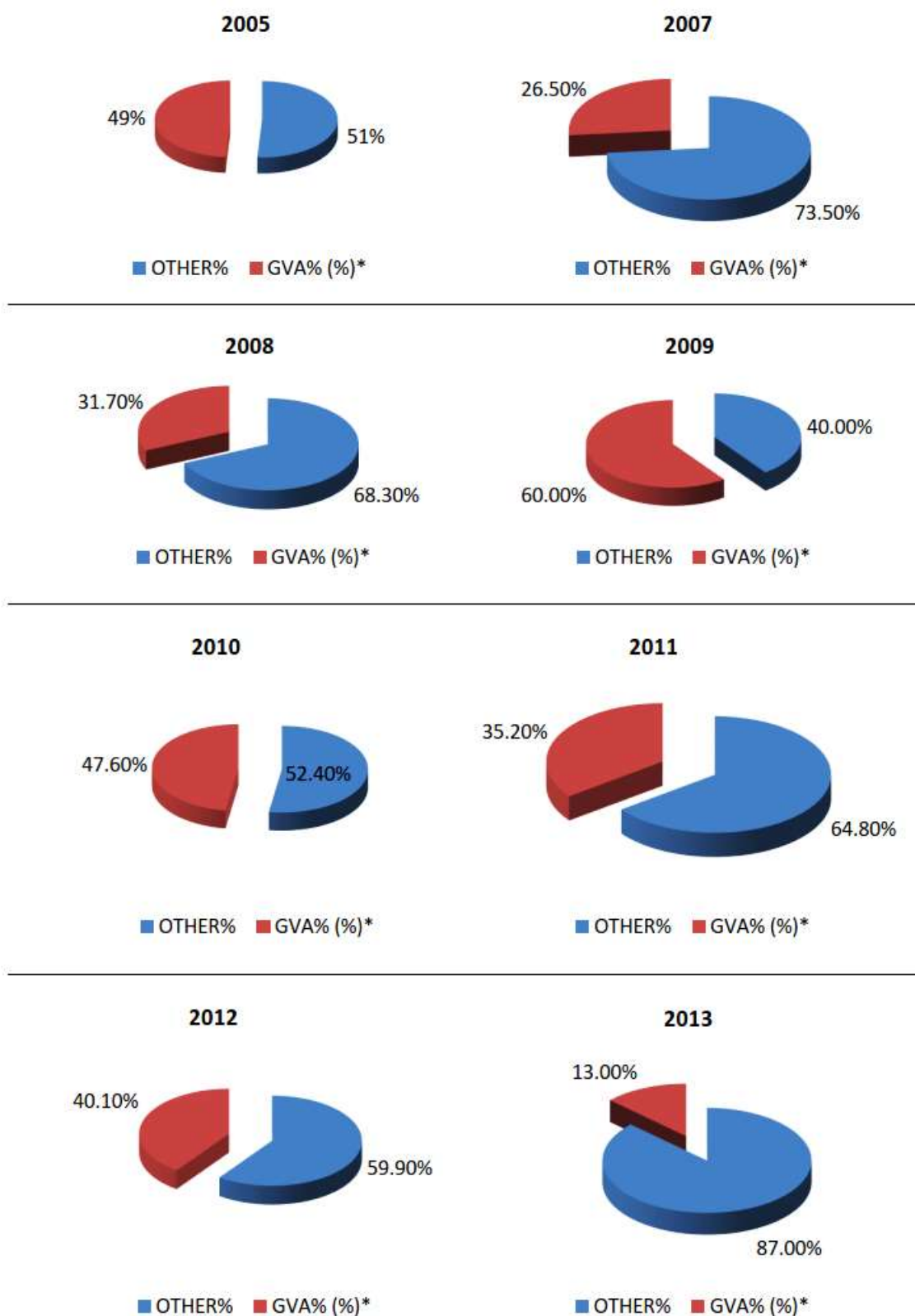
were recorded in 2009 in the amount of US \$ 20 million. After that, investments are declining. In 2010, they amounted to US \$ 13 million, and in 2013 US \$ 3 million (Graph 4).



Graph 4. Graphic presentation of the investments in the sector culture of the Republic of Turkey in B&H in the period 2003-2014

In the period from 2005 to 2013, the highest investments in the Bosnian-Herzegovinian sector of culture (GVA%), compared to other investments, were re-

corded in 2009, when they amounted to 60%. After that, there was a decline and in 2013 they amounted to 13% (Graph 5).

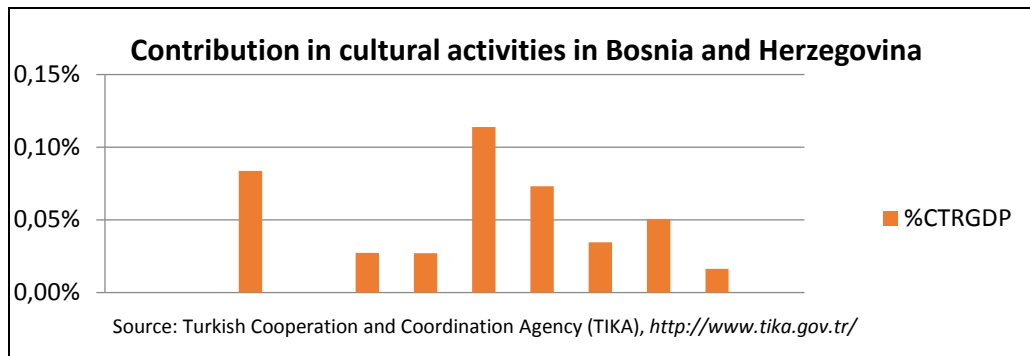


Graph 5. Graphic presentation of the investments GVA% of the Republic of Turkey in B&H in terms of total investments in the period 2005-2009

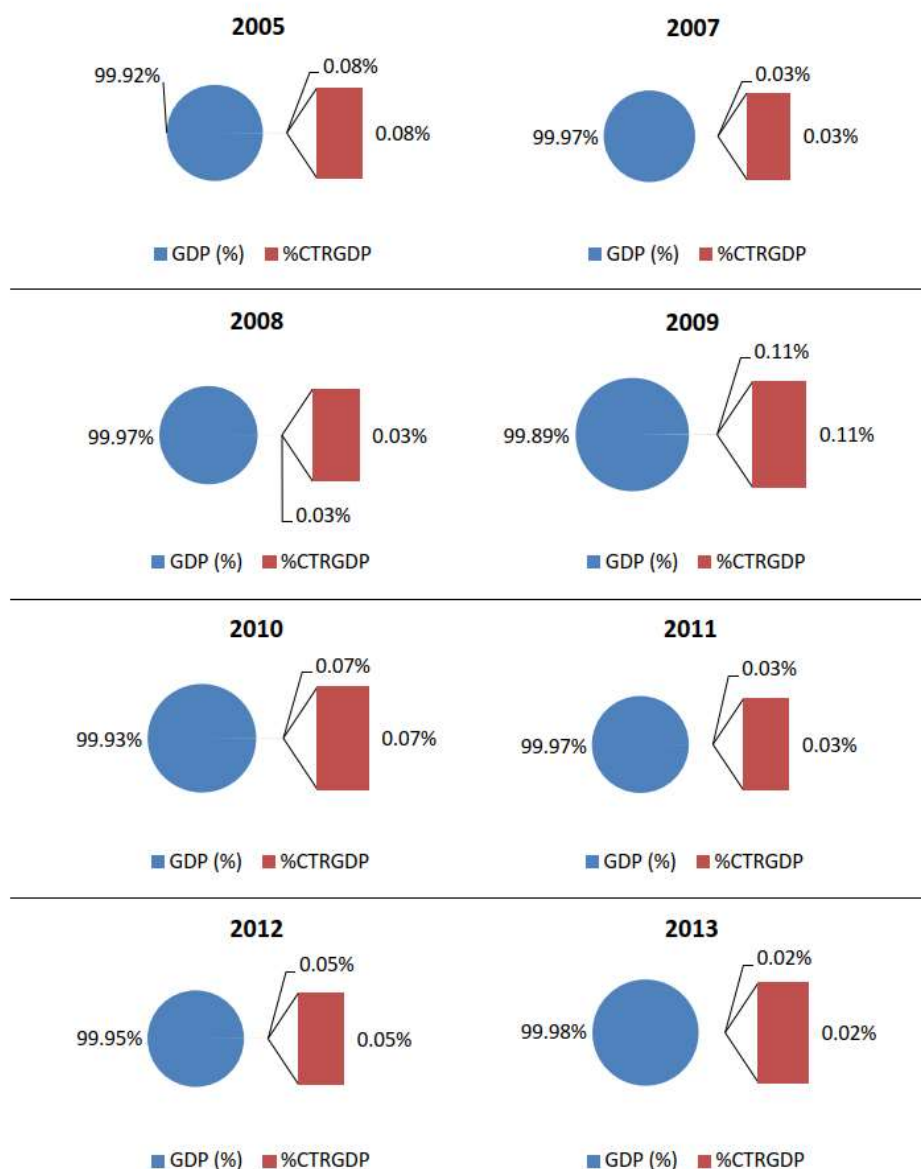
Percentage overview of the contribution of the Republic of Turkey to cultural activities

The contribution of the Republic of Turkey to the Bosnian-Herzegovinian culture sector for the period 2005-2013 is graphically presented (Graph 6, Graph 7). Through the analysis of the data from the graph,

it can be concluded that in the period from 2005 to 2008, the influence of the Republic of Turkey on cultural activities from 0.08% in 2005 to 0.03% in 2008 was reduced. In 2009, an increase of 0.11% was observed, when the highest value was observed. After that, there is a decline, so in 2013 it amounted 0.02%.



Graph 6. Graphic representation of the contribution of the Republic of Turkey to cultural activities of B&H

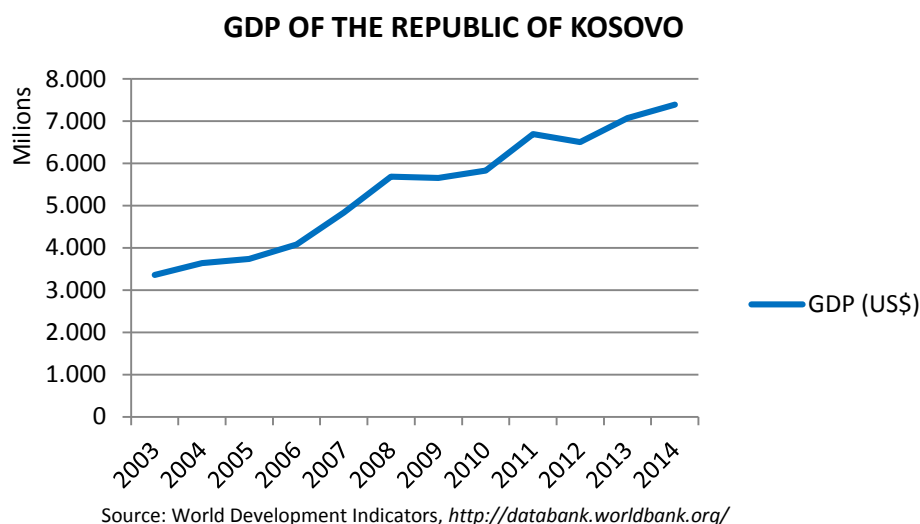


Graph 7. Contribution of the Republic of Turkey to the overall cultural activities of B&H in the period 2005-2013

Contribution activities on economic development of the Republic of Kosovo

Gross domestic product and the impact of the cooperation with Turkey

In the period from 2003 to 2013, Kosovo has recorded a continuous increase in GDP, from US \$ 3.3 million in 2003 to US \$ 7.3 million in 2014, which is an increase of 2.2 times (Graph 8).

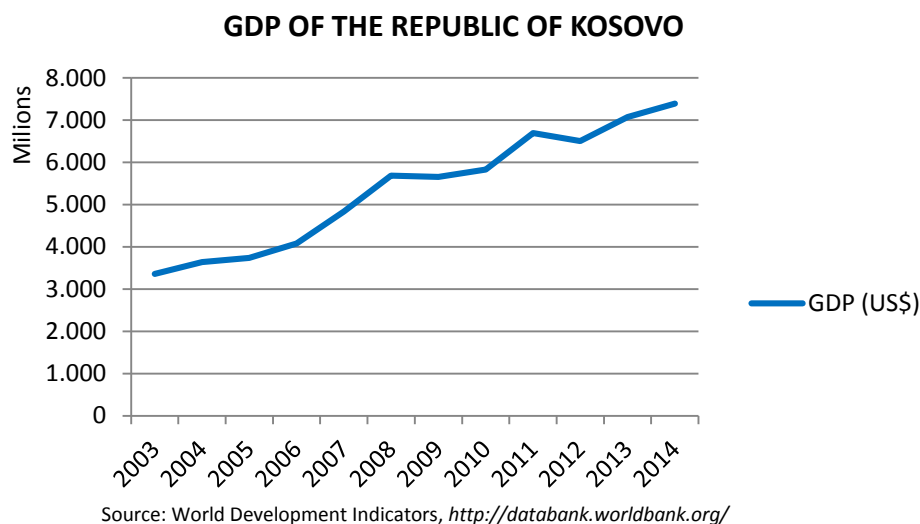


Graph 8. Presentation of the GDP of the Republic of Kosovo in the period 2003-2014

Bilateral help from DAK donors

In the period 2009-2013, the bilateral assistance to the

DAC countries in the Republic of Kosovo has been reduced from US \$ 750 million in 2009 to US \$ 490 million in 2013 (Graph 9).

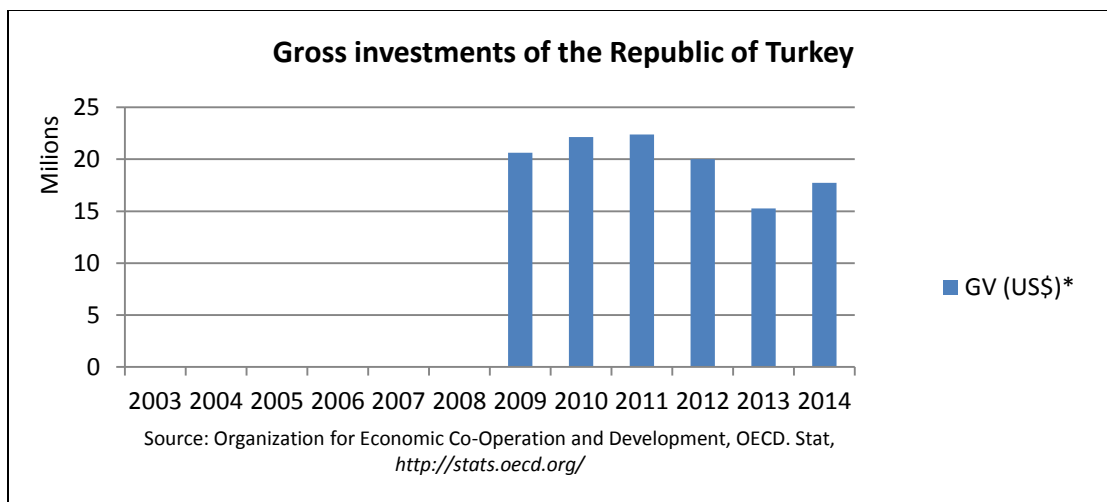


Graph 9. Graphic presentation of the donations of the DAC funds for the Republic of Kosovo in the period 2003-2013

Investments of the Republic of Turkey

In the Republic of Kosovo, in the period from 2009 to 2014, the total investments of the Republic of Turkey

are increased from US \$ 20 million in 2009 to US \$ 23 million in 2011. However, in 2013, there was a decline in investments of US \$ 15 million, while in 2014 there was again an increase of US \$ 17 million (Graph 10).

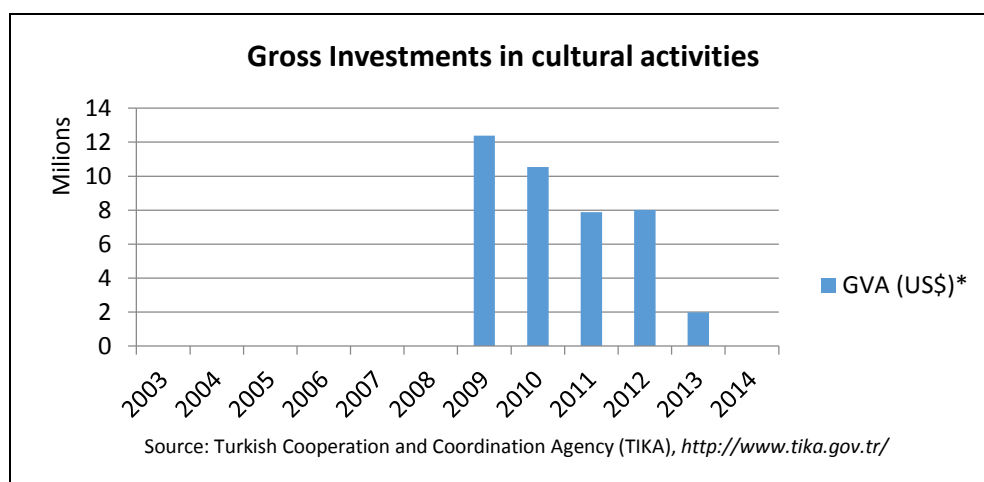


Graph 10. Graphic presentation of the gross investments of the Republic of Turkey in the Republic of Kosovo in the period 2009-2014

Investments in the sector of culture

In the period from 2009 to 2013, the Kosovo cultural sector saw high investments in 2009 when it amount-

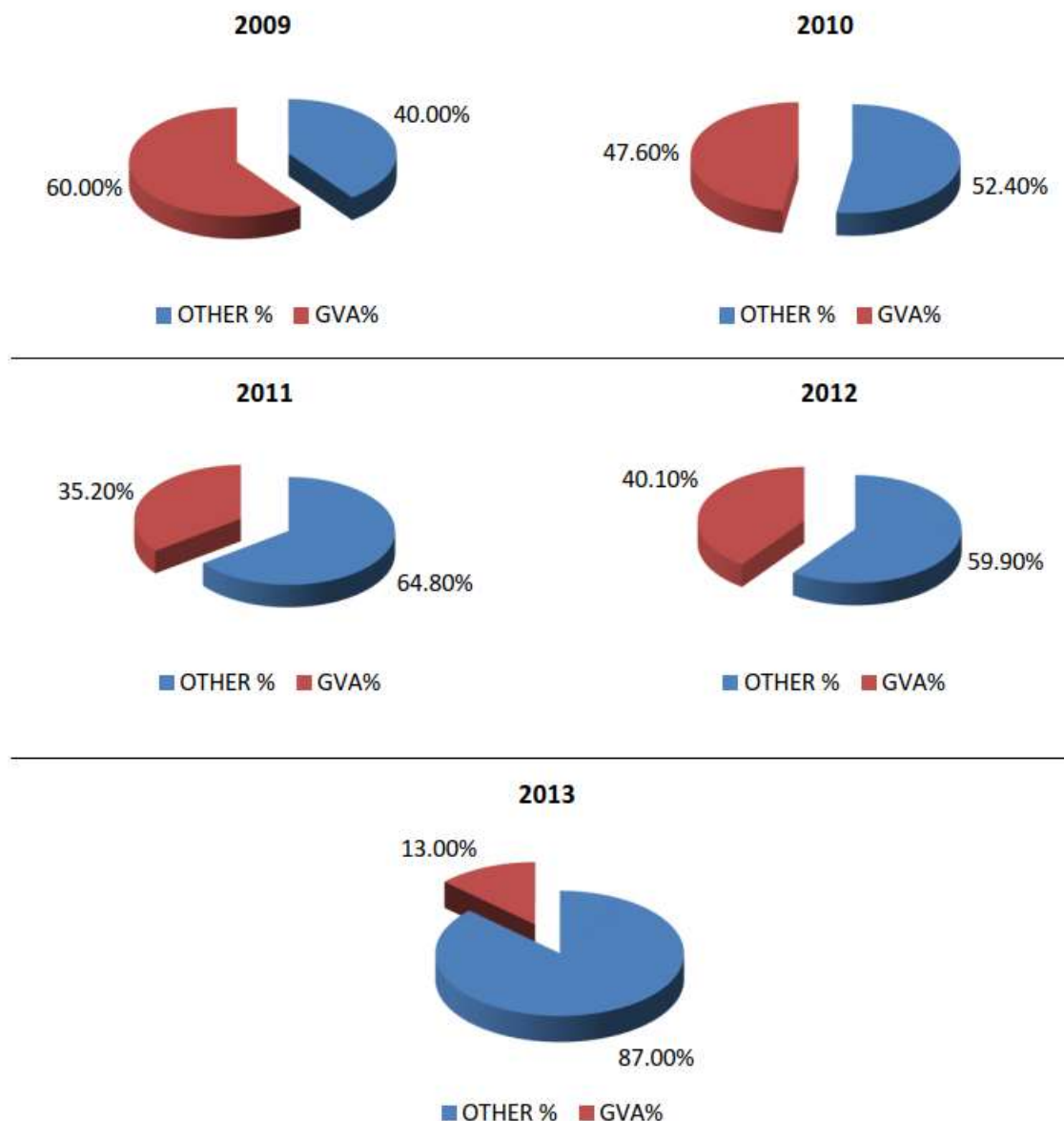
ed to US \$ 12 million. After that, investments are declining. In 2010, it was US \$ 10 million, in 2012 US \$ 8 million, while in 2013 it was US \$ 2 million (Graph 11).



Graph 11. Graphic presentation of the sectoral investments of the Republic of Turkey in the Republic of Kosovo in the period 2009-2013

In the period from 2009 to 2013, the highest investments in the culture sector (GVA%), compared to other invest-

ments, were registered in 2009 when they amounted to 60%, while in 2013 they were 13% (Graph 12).

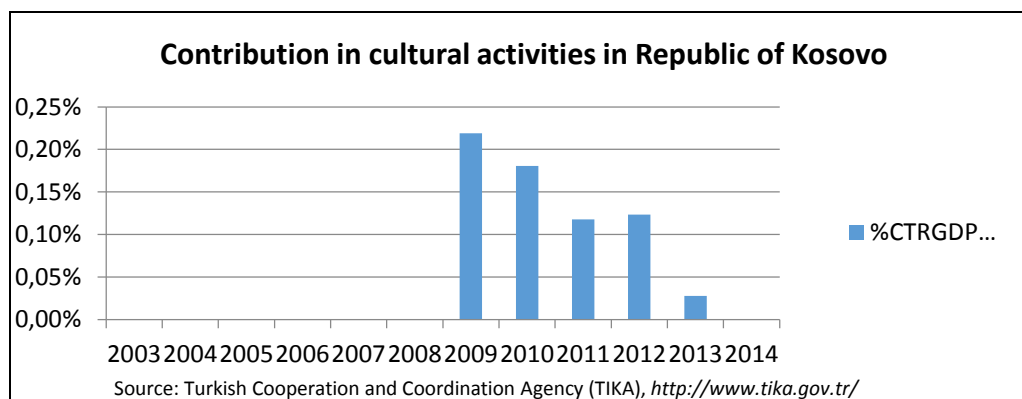


Graph 12. Graphic presentation of the sectoral investments GVA% of the Republic of Turkey in the Republic of Kosovo in relation to the total investments in the period 2009-2013

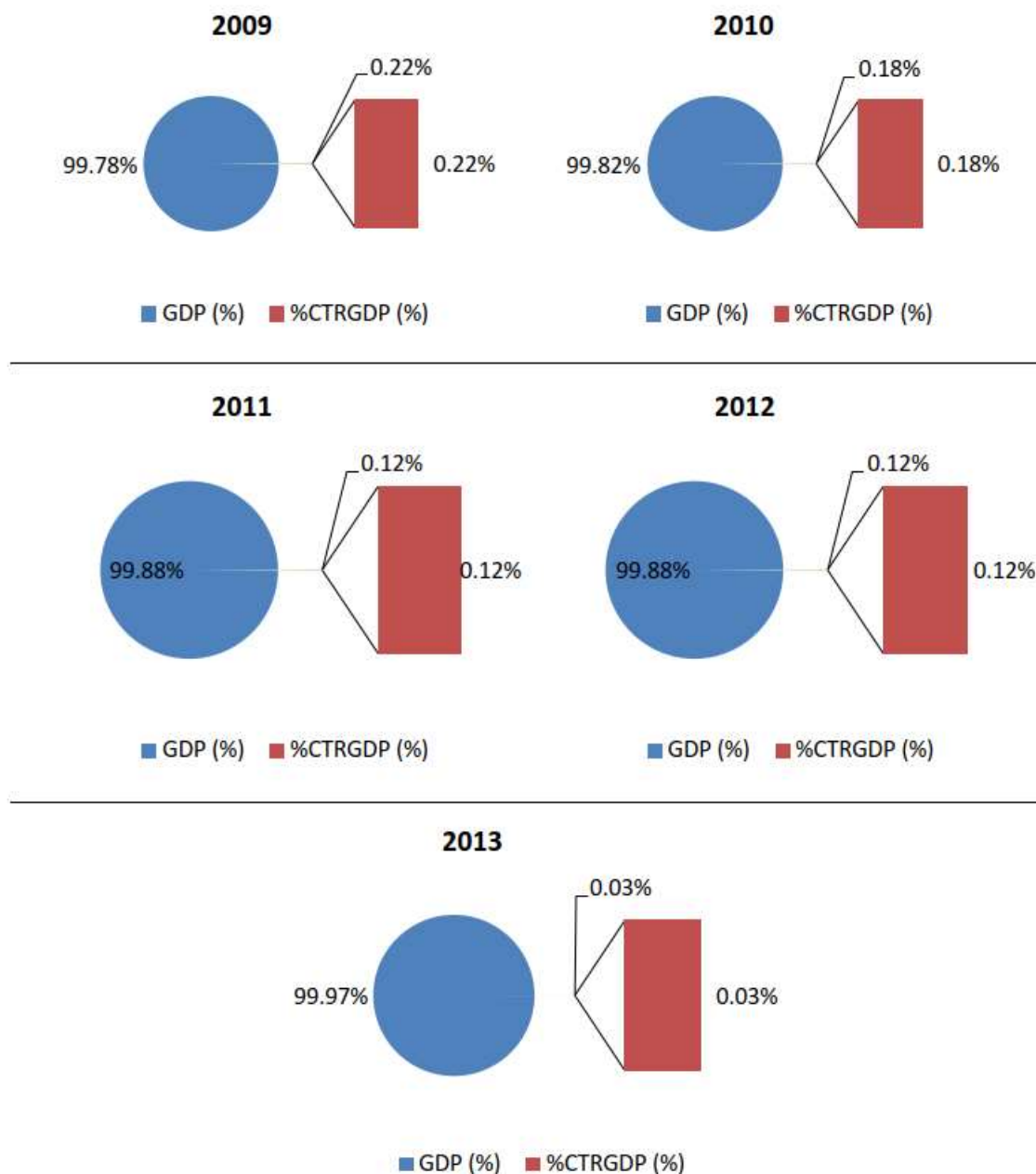
Percentage overview of the contribution of the Republic of Turkey in cultural activities

The contribution to the cultural activities of the Repub-

lic of Kosovo in the period from 2009 to 2013 is shown graphically (Graph 13, Graph 14). Through the analysis of the data, it can be concluded that a decrease of 0.22% in 2009 was registered at 0.03% in 2013.



Graph 13. Graphic presentation of the contribution of the Republic of Turkey in the cultural activities of the Republic of Kosovo in the period 2009-2013



Graph 14. Contribution of the Republic of Turkey to the overall cultural activities of the Republic of Kosovo in the period 2009-2013

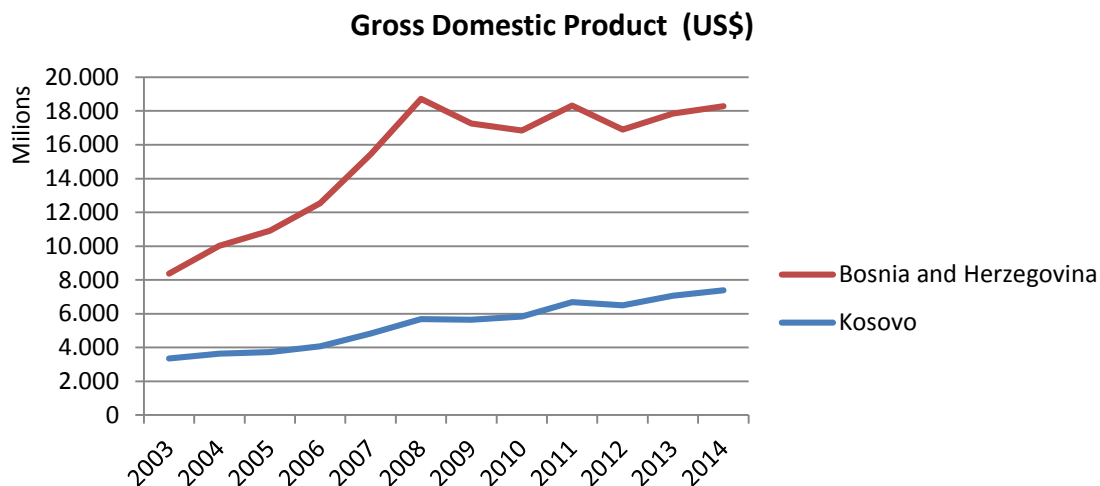
RESEARCH FINDING AND DISCUSSIONS

Gross Domestic Product (GDP)

GDP is the sum of the gross value added of all resident producers in the economy plus all product taxes, then reduced for all subsidies that are not included in the value of the product. It is calculated without deductions for the depreciation of the produced property, for the impoverishment, i.e. for the destruction of natural resources. The data are expressed in US dollars. GDP is calculated by converting the official

exchange rates of domestic currencies and the US dollar over a one-year period.

Comparison of GDP data in B&H and in the Republic of Kosovo is shown graphically (Graph 15). Through the analysis of the data from the graph, it can be concluded that in the period from 2003 to 2014, with oscillatory movements, B&H has seen GDP growth from US \$ 8.3 million in 2003 to US \$ 18 million in 2014, or by 2.2 times. In the same period in Kosovo, a continuous GDP growth of 3.3 million US \$ in 2003 was registered to 7.3 million US \$ in 2014, which is also 2.2 times higher.



Source: World Development Indicators, <http://databank.worldbank.org/>

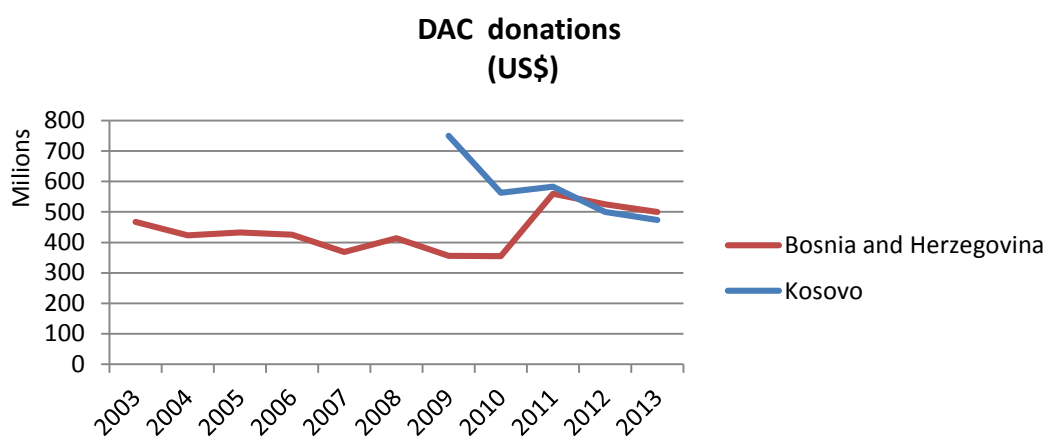
Graph 15. Comparison of B&H GDP and the Republic of Kosovo in the period 2003-2014

Bilateral help from donors of DAC

The net bilateral aid flows from the donors of DAC are net payments for ODA or the official developmental assistance of the members of the Development Assistance Committee (DAC). Net payments are gross leverage payments and loans less repayment of the principal of previous loans. ODA consists of loans concluded under privileged terms (with a grant of at least 25%, calculated at a rate at a discount of 10%) and subsidies made for the promotion of economic development and welfare in the countries and territories of the recipient's list of DAC and ODA. The official support refers to the support of the official donors of countries and territories in Part II of the Census of DAC recipients: advanced countries of Central and Eastern Europe, countries of the former Soviet Union, as well as certain advanced countries in terms of development and territories. Official assistance is provided under conditions similar to those for ODA. Members of DAK are the following countries: Australia,

Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, the Republic of Korea, Luxembourg, the Netherlands, New Zealand, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, United Kingdom, United States of America, and the institutions of the European Union. The data presented are in US dollars.

By analyzing the data (Graph 16), comparative data on the bilateral assistance of the DAC countries for B&H and the Republic of Kosovo are shown, based on which it can be concluded that in B & H, in the period from 2003 to 2010, the value of bilateral assistance in DAC countries have been reduced from \$ 480 million in 2003 to \$ 380 million in 2010. In 2011, the value of bilateral aid increased to \$ 580 million, to be again reduced in 2013 to \$ 500 million. In the Republic of Kosovo, in the period from 2009 to 2013, bilateral assistance to the DAC countries has also been reduced from 750 million in 2009 to 490 million US dollars in 2013.



Source: Organization for Economic Co-Operation and Development, OECD. Stat, <http://stats.oecd.org/>

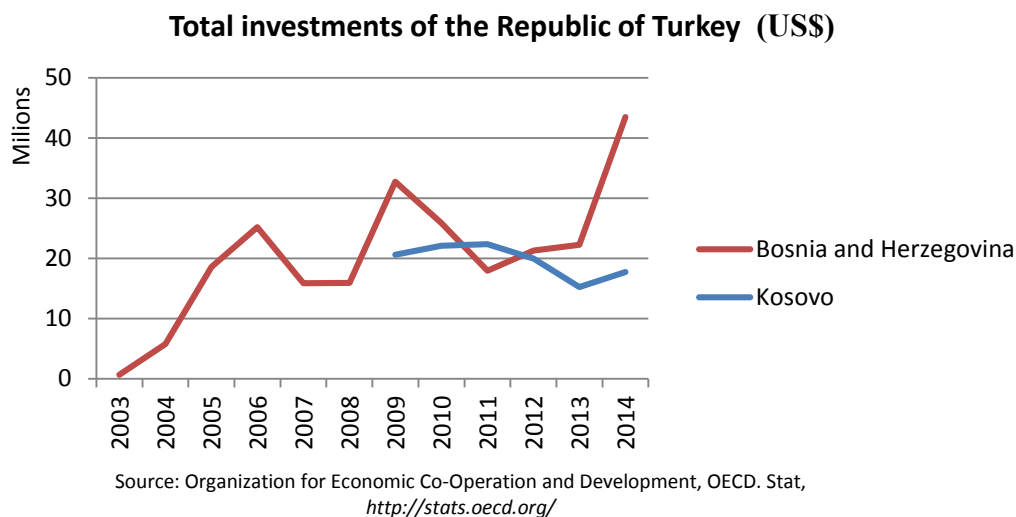
Graph 16. Comparison of the bilateral assistance of the DAC countries for B&H and the Republic of Kosovo in the period 2003-2013

Investments of the Republic of Turkey

According to the analysis of the comparative data, the total investments in B&H and the Republic of Kosovo in the period from 2003 to 2014 (Graph 17) can be concluded that in B&H, with oscillatory movements, an increase in the total investments was registered. In 2004 they amounted to US \$ 5 million, in 2006 US \$

25 million, in 2009 US \$ 32 million, while in 2014 they amounted to US \$ 44 million.

In the Republic of Kosovo, in the period 2009 to 2014, the total investments of the Republic of Turkey increased from US \$ 20 million in 2009 to US \$ 23 million in 2011. However, in 2013, there was a decline in investments of US \$ 15 million, while in 2014 there was an increase of \$ 17 million again.



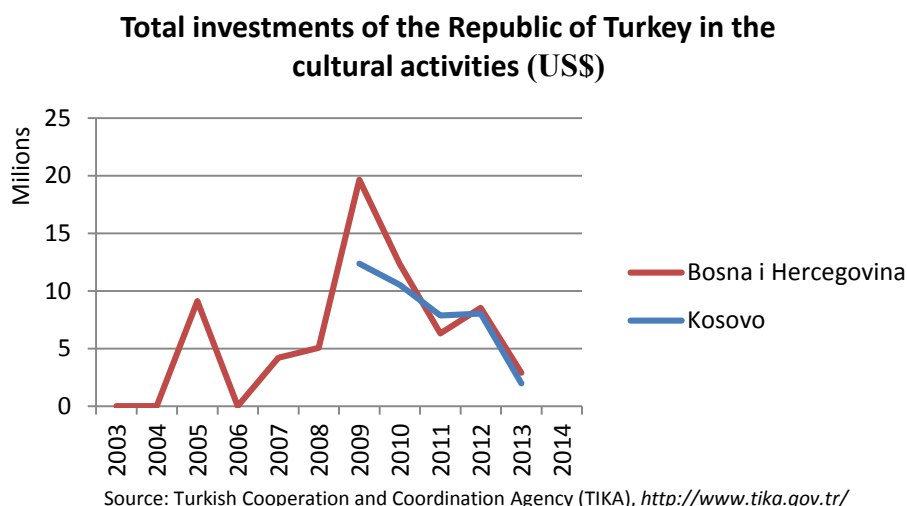
Graph 17. Comparison of the total investments of the Republic of Turkey in B&H and in the Republic of Kosovo in the period 2003-2014

Investments in the sector for culture

In the period from 2003 to 2013, the highest investments in the cultural sector were recorded in 2009 in the amount of US \$ 20 million. After that, the invest-

ments declined and in 2013 amount to US \$ 3 million.

In the Republic of Kosovo, in the period from 2009 to 2013, the investments were also reduced by \$ 12 million, which amounted to 2 million in 2013 in 2009 (Graph 18).



Graph 18. Comparison of the total investments of the Republic of Turkey in the cultural activities of B&H and the Republic of Kosovo in the period 2003-2013

CONCLUSION

The disintegration of the SFR of Yugoslavia, which once partially entered the composition of the Ottoman territory, intensified the activities of the Republic of Turkey for a more active presence in the countries that emerged from it. Primarily, the impact is economic and cultural, but the tendency of general geopolitical influence cannot be neglected, because it is one of the most important Eurasian states that NATO needs as a member of the NATO alliance, since the main gas pipelines and oil pipelines will pass through Turkey. Societies and leaders interpret history in different ways, but it turns out that the wrong perception of the past should not be an obstacle for a healthy conception of relations in the future. Historical reminiscences about the linking of the Balkan states of Islamic features cannot be in the function of science, and Turkey will definitely further strengthen its role in B&H, in Kosovo and in the Balkans in general.

In addition to the efforts of the West and Russia in order to intensify political and economic power in the Balkans, Turkey's efforts to keep if not flaunt their influence are also lagging behind. If Turkey were not to become a member of the Union, in that case, Bosnia and Herzegovina and Kosovo would become the most western points of the anti-war populations, and could serve as an EU entry, given that these countries can enter the Western Balkans region smoothly and with that in the EU.

Encouraged by numerous qualities, especially economic growth, Turkey has many landmarks that have been enhanced by very high economic growth and economic growth. These are the reasons that, in its foreign policy, it will not allow the peripheral country to remain in the context of EU integration. The opinion of certain authors that Turkey is a "poor country" is not based on expert analysis. Such an interpretation makes it difficult to get to know the real development dynamics and the political idea about it. Namely, despite the global economic crisis, internal turmoil and terrorism problems, Turkey has recorded remarkable economic progress and attracted special attention of world power centers.

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ANALYSES AND CONSERVATION STRATEGIES OF INDIGENOUS ILOKANO FOLKSONGS IN NORTHWESTERN CAGAYAN, PHILIPPINES

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ABSTRACT

The study collected and analyzed the content, theme, and virtues nested in the indigenous Ilocano songs in the North-western part of Cagayan province, Philippines. These folksongs are expressions of Ilokanos' thoughts, feelings and emotions as shown in the folksongs on love for humanity and the natural world. The themes are focused on being proud, happy and thankful for the quality of life they have, for any beautiful thing, for the love of family, and for the gift of nature. The dominant virtues traced include faithfulness, idealism, optimism, industry, humility, unity, pride, love and respect. Preservation and conservation of these folksongs is possible through collecting and documentation, transforming these songs into various media (printed and electronic), and establishing a folksong museum which could be a Center of Folksong- Knowledge Transmission. Government and the academic community should help support the conservation of authentic Ilokano songs before these shall be forgotten.

Keywords: *content analysis, Ilocano folksongs, indigenous songs, Northwestern Cagayan, preservation and conservation, translations*

INTRODUCTION

Music is the language of the soul. It is a form of language that has to be continuously communicated to the succeeding generations so as not to lose its intrinsic worth, symbols and forms, as well as its varying meanings (Buenrestro & Cabbab, 2013).

The International Folk Music Council as cited by Culig (2012) defined folk music as a musical tradition that has evolved through the process of oral transmission. And because of their inherent qualities, aesthetic or practical, folks have a mass appeal that has survived the test of time; passed from one generation to another. Kranenburg et al. (2007) noted that these were sung by common people during work or social activities. One of their important characteristics is

that they are part of oral culture. The melodies and texts are learned by imitation and participation rather than from books.

The early Filipinos had songs of a great variety, expressive of a gamut of human experiences and feelings. The natives sang at almost every occasion- at work, at worship and at play. And all occasions, both trivial and eventful, inspired the spontaneous creation of songs. They had lullabies, street songs, work songs, game songs, victory songs, love songs, and funeral dirges and the like (Baltazar et al., 1981). These folk music are also referred to as FOLKSONGS.

Enriquez (2006) defined folksongs are songs that have been handed down orally through generations. These are sung to a repeated melody and committed to memory from the lips of others.

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They embody faith, joy, the varied hopes and odds of life. Ogundokun (2015) added that folksongs like any other forms of orator are transmitted from generation to generation, and they are called tradition. Culig (2012) noted that folksongs are generally simple. They have repetitive melody and rhythm, limited ranges, and scale systems that are germane to or assimilated by their cultures of origin from a prolonged close contact with another culture/s. Their lyrics often relate to daily activities which readily make them part of the everyday lives of people regardless of age. They are mostly participatory and functional like singing games, counting songs, work songs, cradle songs, bathing songs, rice pounding songs, war songs, religious songs and even fun non sense songs.

Traditional music is music of the people. It belongs to people of all levels of music ability. Transmitted orally, one does not need any special vocal training to sing a folk song. Since it is handed down orally, from one generation to another, there is no single "correct" version of the folk tune (Aurelio, 2000).

The folk song, as a form of folk lyric expresses the hopes and aspirations, the people's lifestyles as well as their loves (Ortega). Many of these same songs are still sung by Filipinos today to enlighten the cares of life, to pass the time or to kill boredom.

From the several songs that have come down to us through the centuries, Baltasar et al. (1981) pointed out that those of the highland tribes still sing the songs in the old chanting manner while those of the lowlands already show an influence of Western culture, especially in melody. In the study of Bohlman (1988) as cited by Culig (2012) he discussed the dynamic nature of folksongs brought about by urbanization, and modernization of societies. Thus, now exist notated, arranged, authored, and modernized folk songs.

Hence, for folksongs to preserve their authenticity and for the lines of these songs to continually echo across generations and boundaries, the collection and documentation of these folksongs have to be properly captured and preserved.

Meanwhile, Ilokano or Iloko refers to the people and the chief regional language of Northern Luzon. It is spoken by the group of provinces in the Ilocos Region, Cagayan Valley Region, Central Luzon, and it is the lingua franca of all the mountain provinces of Luzon (www.manoa.hawaii.edu/ilokano/mission.html).

In the Northwestern part of Cagayan province, Philippines, the Ilokanos here had a great number of

folksongs. Some are still sung and are well-documented, but there are many which are yet to be collected, documented and preserved. It is imperative that these folksongs are to be recorded before they shall be forgotten and affected by modernization, cultural diffusion or intermarriage with other tribes. Moreover, the collection of such is in consonance to the Harmonized National Research and Development Agenda (HNRDA) of the Department of Science and Technology (DOST). The collection of these folksongs fall on the Documentation of Indigenous Knowledge, and Music in Indigenous Filipino Expressive Culture strands of the Inclusive Nation-building-ATIN program (Ang Tining Natin) Program of the National Integrated Basic Research Agenda (NIBRA) Research and Development area of the department (DOST HNRDA 2017-2022).

The collection of these Ilokano folk music is also in line with the general provision of the Philippine Constitution, Article XIV, Section 14, which states that the Senate shall foster the preservation, enrichment, and dynamic evolution of a Filipino culture.

Believing that the culture of a group of people is considered as their wealth, the richness of their culture must be given due recognition. Through the collection, preservation, and study on these folksongs, culture pride would be developed among the Ilokanos.

Likewise, the collection of these folksongs could become rich and effective educational resources for both the instructor and the students in providing them a body of readings for the subject Literature of the Philippines.

There have been studies made on folklore in general in the different provinces in the country. However, for the folksongs in particular, in Northwestern part of Cagayan, Philippines, these folksongs have yet to be given greater attention. This study takes concern on documenting, translating to English language the Ilokano folksongs, and designing a program that would protect and conserve the interesting lore preserved in this land.

OBJECTIVES OF THE STUDY

The study generally aimed to collect the Ilokano folksongs sung in the Northwestern part of Cagayan, Philippines. Specifically, the paper intended to identify the content and theme of these folksongs; to trace the virtues present in them, and to design a preservation and conservation strategem for these Ilokano Folksongs.

METHODS

This is a qualitative study that used documentary and content analysis of the folksongs sung in the Ilokano speaking community in the Northwestern part of Cagayan, Philippines. Personal interview was used in gathering the data for analysis. The folksongs recited/sung/explained by the folks were noted down/recorded with the use of cell phone recorder. The study was conducted in the towns of Sta. Praxedes, Claveria, Sanchez Mira, Pamplona, Abulug and Ballesteros from January-December 2017. These predominantly Ilokano speaking municipalities in the second district of Cagayan province were located at the Northwestern part of Cagayan, Region 02, Philippines.

Purposive random sampling was employed to select the senior citizens with knowledge on folksongs and retired professionals with inclination to music to be the key informants. An interview guide was constructed. Informed consent was also prepared. The informants were given the option to write down all the Ilokano folksongs they know on a sheet of paper, or they could recite or sing the song. The researcher took down notes and at the same time recorded the data/lyrics/wordings that come directly from the mouth of these informants. The researcher collected 23 Ilokano folksongs. Folksongs with translations and interpretations readily available to be downloaded from the internet were not included in the study.

In processing the data, the researcher transcribed the recorded information, and classified the materials. Also, the researcher tried translating them into suitable English language. In the translation of the Ilokano folksongs to English, the researcher used Eugene Nida's translation theory that since there is no such thing as "identical equivalents", and what one seeks to do in translating is to find the "closest natural equivalent", both formal equivalence and dynamic equivalence were adopted. Formal equivalence focuses on the need to pay attention to the form and content contained in the message, while dynamic equivalence focuses on the message received by the audience.

In the process of finalizing the text of the collected Ilokano folksongs and of the translated English equivalents, knowledgeable music enthusiasts evaluated the accuracy of the text and English language and literature teachers were requested to assess the correctness of the text's translation to English.

Analysis through coding was made to reveal the content, theme and virtues on the folksongs. An induc-

tive coding process was useful in determining categories (Le Compte and Schensul, 1999). With that, the researcher used an inductive analysis strategy to generate descriptive categories from the data. This strategy was used to identify the salient themes within the data. In the coding, incidents, the smallest unit of information in a text was looked into first, then the identified incidents were given codes to analyze the data. With this, a preservation and conservation program was designed for this purpose.

RESULTS AND DISCUSSION

Content Analysis, Thematic Evaluation and Virtue Search of the Ilokano Folksongs

The content of the songs as reflected from the lyrics are of diverse ideas. The Ilokano folksongs gathered in the Northwestern part of Cagayan are classified into seven categories: 1) songs of the heart (a) courtship and (b) broken relationships, 2) songs on the joy/importance of having a mother, 3) songs on the life of a farmer, 4) songs about idealism and wishful dreamer of an Ilokano, 5) songs on admiration to beautiful Ilokano ladies, 6) songs about nature/natural world, and 7) non-sensical song. Jan (1998) in his study pointed out four thematic content like paddy works, healing, entertainment and children games. Also, in his study, he lamented that only a small group of the traditional villagers can sing these songs and these songs seemed to be unknown to the youth.

In the study of Culig (2012) on the content analysis of Asian-Pacific Folksongs, she identified 16 thematic contents. Some of the classifications included in her study which were also the same thematic contents found in the Ilokano folksongs are natural world, home and family, friendship/love, worksongs and nonsense songs. On the other hand, the content of the folksongs in the study of Haruna (1998) about the Bura folksongs, their content are all-encompassing. Those folksongs express Bura people's sociocultural values, religious beliefs and experiences. Some songs abuse or satirize individuals or groups of people. Other songs treat subjects such as love, marriage, death, kinship, religion or politics. As regards the virtues traced in the folksongs, the Ilokano's traits are reflected in these folksongs. As Yabes (1936) described in his article, the Ilokano character and culture is simple in life, heart, and taste, humble, religious, industrious and thrifty.

He also gave this descriptions of an Ilokano as utility man, one who interprets life in terms of usefulness; Ilocano girls as reserved, conservative and orthodox; they hide their emotions, represses their feelings, a man of action. Also, he noted that Ilokanos think as they work; their patience, endurance and ability to stick and concentrate on anything they do are the secret of their success. Ilokanos go anywhere, they penetrate into strange territory and get along well and make friends with everybody. The folksongs of Ilocandia as a whole are more expressive of joy, vigor, activity and optimism. They are expressive of the true spirit of Ilokanos. That despite their centuries of subjection, they have not lost the vigorous and optimistic spirit of their forebears (Yabes, 1936).

In the study of Yalcinkaya (2015) among the values present in the songs in the elementary books, there were 19 virtues identified, and some of which are virtues also traced in the Ilokano folksongs like that of love, respect, self-esteem, diligence, tolerance, loyalty, and solidarity.

As regards the unifying ideas of the 23 folksongs under study, the themes focused on being proud, happy and thankful for the quality of life they have, for the love of beauty inside and out and the many faces of love, for the love of family, mother and children, and for the gift of nature.

A more vivid description on the 23 folksongs under study is found below. It is noted that the English translations of the Ilokano folksongs are in the full blown research, and were not included in this text.

Folksong #1: *Bambantay, Turturud* (Mountains and Hills)

The song tells the simplicity of life and it boasts and encourages one to visit the bounty in mountains and hills where they live.

Theme : Be proud and thankful to the quality of life you have.

Virtue: Pride on what one has.

Folksong # 2: *Dagiti Mulak* (My Plants)

The folksong illustrates the life of a farmer that at times, there is a low produce because of unforeseen occurrences.

Theme : Life is full of challenges.

Virtue: Industry/Steadfastness- Ilokano farmers remain strong in spite of obstacles.

Folksong # 3: *Denggem Ading* (Listen My Dear)

The song depicts s the love of a man that is real, that his love for a woman is eternal.

Theme : Everything that a person in love sees is beautiful.

Virtue: Faithfulness-Ilokanos pursues the love of a woman who is sometimes fickle-minded.

Folksong # 4: *Di Kan Agsangangit* (Cry No More)

The song talks about a man appeasing a woman cying so hard because of a broken relationship.

Theme: Do not cry over a broken relationship.

Virtue: Optimism- if one door closes, another opens.

Folksong # 5: *Dikanton Malipatan* (I will Never Forget You)

The song tells that true love knows no boundaries, no ending. There is forever that death cannot even deter.

Theme: True love means forever.

Virtue: Faithfulness- Ilokanos offer an everlasting love.

Folksong # 6: *Diro ni Ayat* (Sweetness of Love)

The song talks about lovers who agreed to be together and decided not to separate until the end of time.

Theme: We need a companion to lean on.

Virtue: Faithfulness-Ilokanos are sweet lovers.

Folksong # 7: *Dunggiar* (Dunggiar)

The song illuminates Dunggiar, who died in search for a ladylove.

Theme: True love is hard to find.

Value: Perseverance- An Ilokano is ready to die in the name of love.

Folksong # 8: *Igid diay Baybay* (By the Seashore)

The song tells about the plans of the man to his ladylove to go by the seashore, sing their love song, and feel the complete happiness, peace and gratification in the area.

Theme: There is joy in the presence of nature.

Virtue: Idealism- Ilocano lovers make sweet promises (both possible and the impossible).

Folksong # 9: *Intan Neneng* (Let's Go My Dear)

The folksong speaks of the sweet-tongued nature of an Ilokano lover- going to the moon, and not loving anybody else but the girl of his love.

Theme: Love has many promises.

Virtue: Idealism-Ilokano suitors dare to dream big.

Folksong # 10: *Inton Agkasarak* (When I get Married)

The song tells the ideals, wishes and dreams of a girl when she gets married. At times, they would even dream of the impossible dreams.

Theme : Marriage for ladies matter.

Virtue: Idealism- Ilokana woman, too, has great dreams.

Folksong # 11: *Ipuon ko nga Irugi* (I Will Start from the Beginning)

The song talks on the challenges in the life of an orphan.. In the absence of the mother, usually, the eldest takes the responsibilities left by the mother particularly on taking care of his/her siblings.

Theme: Mother gives light to the house.

Virtue: Love. Mother's love and care is of importance to children.

Folksong # 12: *Katuday* (Katuday)

This song tells about a man wishing the impossible- that if ever he would be a ring, he would always cling to the fingers of his lady. If she would be a pineapple, he would pick her although still unripe and keep her until she ripens in his heart.

Theme: The figments of imagination are sometimes stronger than life's realities.

Value: Idealism- An Ilokano lover is a dreamer.

Folksong # 13: *Kuna ni Nanang* (Mother's Advise)

The song reminds us the importance on the role of mothers in our lives. That without them, life will lose its direction. It also emphasizes that the love of a step-mother does not equate a mother's love.

Theme: Mother's love is beyond compare.

Virtue: Love- Children long for the love of a mother.

Folksong # 14: *Lubi-lubi* (Pounding Activity)

The song talks about the introverted lady all through the year. She refuses to go out for a "lubi-lubi" (banana or cassava pounding activity of young boys and girls) because of the presence of individuals in the place.

Theme: Ladies are cautious.

Virtue: Conservativeness- Ilokanas are typically shy.

Folksong # 15: *Maymaysa ti Pusok* (One Heart)

This song is about a lover persuading a girl who seem to doubt his love. That is why he promises that his one heart is just for her ladylove.

Theme: Girls are hard to get.

Virtue: Faithfulness- Ilokano suitors are one man-one heart.

Folksong # 16: *Nagsabong ken Ayat* (Flowered with Love)

The song recounts a love that has never bloomed to reality because of the man's infidelity. As the woman recalls her long lost love, she cannot help but faint in her disappointment.

Theme: Love sometimes is unfair that it is not fitly

reciprocated.

Virtue: Fidelity-Loyalty to a partner keeps the relationship longer.

Folksong # 17: *Nagsaway a Pintas mo* (Unfading Beauty)

The song tells about a lady who seems to monopolize all the beauty on earth- one with curly hair, sparkling white teeth, with star-like dimples and eyebrows like the rainbow.

Theme: Beauty draws joy, curiosity and attention.

Virtue: Beauty- Ilokanos adore beautiful ladies

Folksong #18: *Ni Mannalon* (The Farmer)

The folksong talks about farming as one of the major sources of living of the Ilokanos. It shows the importance, simplicity and the laborious work of a farmer. He may be poor, but he provides the basic needs especially, rice, fruits, vegetables and other products that are important in our daily lives.

Theme: Work and earn for a living.

Virtue: Industry- Ilocano farmers work hard for the community.

Folksong # 19: *Ni Nanang Ko* (My Mother)

The song narrates the love, care and concern of a mother to her son/daughter that is immeasurable. In the song, the child also tells the birth of his/her mother in summer time when trees and flowers are in bloom.

Theme: Mother knows best.

Virtue: Love- The love of a mother is beyond compare.

Folksong # 20: *Papanam Kulibangbang* (Where are you Heading butterfly?)

This song talks about a lady, who was referred to as butterfly, who went on to let her handkerchief be repaired. The song also advises young men to choose a red-lip lady for that woman is a sure hit.

Theme: Choose a person to live with upon the advice of the old.

Virtue: Beauty- Ilokanas are simply beautiful.

Folksong #21: *Tarong, Kamatis, Parya* (Eggplant, Tomato, Bittergourd)

The song talks about the three vegetables which prides oneself on a particular quality. One boasts about its being delicious. Another answered back that dinengdeng (native Ilokano cuisine) is at its best with its presence.

Theme: Do not boast as if you are best.

Virtue: Humility- Be proud of what you have, but live still with humility.

Folksong #22: *Ti Ayat ti Maysa nga Ubing* (The Love of a Young)

The song compares the love of young that is sweet and fresh with the love of the old that is bitter and upsetting. The old man is advised to look for a widow and to forget the love of a young especially if the girl has already found her THE ONE.

Theme: It is more comfortable to live with someone of your age.

Virtue: Beauty-Beautiful and young ladies are adored.

Folksong # 23: *Uppat a Pato* (Four Ducks)

The song talks about the happy, cohesive and unrestricted life of ducks as observed by the persona.

Theme: Free yet united creatures are happy beings.

Virtue: Unity-Happiness in being together.

Preservation and Conservation of the Ilokano Folksongs

In terms of its preservation and conservation, the government and the academe in the Ilokano speaking communities should work hand in hand for the establishment of a folksong museum, which could also be an institute of folksong-knowledge transmission. A particular body in the academic community should control its implementation. The support of the community is also needed because the success in the transmission of these folk songs to the next generations is dependent on collaboration of the academic community and the townsfolk lead by the community leaders.

The government funding agencies and the research and development arm of learning institutions should support a research grant to researchers who pursue Ilokano folksong studies.

In schools and in the community, competitions on folk singing in solo, pairs or in a group should be initiated. They could also set a month in a school year where different schools/colleges or different barangays in the town meet and compete for folk song interpretation.

Although folk singing is integrated in the Philippine Literature classes and it is a part of the curriculum of all degree and non-degree courses in tertiary education, this is not enough.

These folksongs should also be transformed into several varieties of print and electronic media for easier access. Song books on these Ilokano folksongs are to be made. Also, folk songs in volumes of CDs/DVDs or a series of musical-radio programs should be produced. Recorded Ilokano songs sung by children or adults be uploaded in the internet or you tube for easier access

and preservation on these songs.

These are important measures to conserve and preserve these pieces of local heritage for the future generation. Tejero (2008) noted in her study that the Philippine traditional music is undoubtedly a very important part of our cultural heritage; however, it is endangered of extinction. Hence, the production of music materials (workbooks, librettos for musical plays, ethnic-based compositions, tapes, CDs, VCDs and DVDs were developed in her research.

Techie and Tetteh (2016) in their study emphasized that it is the extinction problem occurring from change in taste and preference of the youth in outmoded oral art forms like the S'wamba folksongs that has engineered a study to recreate awareness of the benefits of importance of orature. They added that "There is a need to preserve these similar art form and songs for posterity. These folk songs and other traditional oral forms shape the history and identity of an indigenous community." Legall (2008) pointed out in her study that the preservation of traditional knowledge involves the documentation of traditional knowledge via the provision of registers, inventories, and databases. Also, preservation involves the promotion of traditional knowledge through educational initiatives.

Also, the idea that could be noted was the one of Buenrostro and Cabbab (2013) who noted that it is our responsibility to preserve the materials of cultural heritage. It is important to relive and capture the remains of the Filipino classical music, so that this music era, genre and forms will forever live. This tangible collection of music heritage has cultural, historical and symbolic value-a real asset of the country.

CONCLUSION AND RECOMMENDATIONS

The Ilokano folksongs were expressions of their thoughts, feelings and emotions. The folksongs reflect the way of Cagayano's life that is full of ideals, beliefs and aspirations which are significant to the development of their moral and social values. Support from the government and the academic community is needed to realize the establishment of a folksong museum to preserve and conserve these songs from our forebears before these shall be forgotten.

It is recommended that further research in the gathering of unpublished original data on folksong for its preservation and conservation shall be funded. The Ilokano folksongs should be adopted as supplementary materials for learners in the Ilokano speaking communities in elementary, secondary and tertiary levels.

When all folksongs in Cagayan shall have been gathered, translated and analyzed, they should be published in a book form and circulated within and outside the province. A study should also be made focusing on putting musical notation on these folksongs, be sung by Ilokano singers, be recorded in CDs to penetrate the national market and the ASEAN Community. The same study should be conducted in other towns of Cagayan and other Ilokano speaking provinces to have a more comprehensive listing of indigenous Ilokano folksong and to strengthen the moral values of the people. A functional Center for Ilokano Folksong knowledge transmission be instituted in the academe to lead the safe keeping and preserving of this lore.

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ISOSCELES TRIANGLES ON THE SIDES OF A TRIANGLE

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Original scientific paper

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ABSTRACT

Famous construction of Fermat-Torricelli point of a triangle leads to the question is there a similar way to construct other isogonic centers of a triangle in a similar way. For a purpose we remember that Fermat-Torricelli point of a triangle $\triangle ABC$ is obtained by constructing equilateral triangles outwardly on the sides AB, BC and CA . If we denote third vertices of those triangles by C_p, A_1 and B_1 respectively, then the lines AA_p, BB_1 and CC_1 concur at the Fermat-Torricelli point of a triangle $\triangle ABC$ (Van Lamoen, 2003). In this work we present the condition for the concurrence, of the lines AA_p, BB_1 and CC_p , where C_p, A_1 and B_1 are the vertices of an isosceles triangles constructed on the sides AB, BC and CA (not necessarily outwardly) of a triangle $\triangle ABC$. The angles at this work are strictly positive directed so we recommend the reader to pay attention to this fact.

Keywords: Ceva, Menelaus, Stewartes, cevian, concurrency, collinearity, Fermat, Torricelli

INTRODUCTION

Leading idea for this work was Napoleon Triangles and Kiepert Perspectors, submitted by Floor van Lamoen (2003) to Forum Geometricorum in which the complex numbers are used to show the existence and the construction of Fermat-Torricelli point. Observing the historical facts we can see the Fermat-Torricelli point is one of the extremal points of a triangle, same as the centroid is. Namely if the point O is constructed in the plane of a triangle $\triangle ABC$ then the sum $AO+BO+CO$

is minimal if and only if O coincides with Fermat-Torricelli point of a triangle $\triangle ABC$ (Prasolov, 2001). Later as a special case we will see this one leads to the condition $\angle AOC = \angle BOA = \angle COB = \frac{2\pi}{3}$. The sum $AO^2+BO^2+CO^2$ is minimal if and only if O coincides with the centroid of a triangle $\triangle ABC$ (Altshiller-Court, 2007). One can ask the question when the sum $AO^3+BO^3+CO^3$ is minimal, or some other questions. The theorem we present shows that any point in the plane of a triangle can be constructed using an isosceles triangles and certain condition.

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MAIN THEOREM

Theorem 1. In a nondegenerated triangle $\triangle ABC$, $\angle CAB = \alpha$, $\angle ABC = \beta$, $\angle BCA = \gamma$. Let the points A_1, B_1 and C_1 lie in the plane of a triangle such that $\angle ACB_1 = \angle B_1AC = \varphi$, $\angle BAC_1 = \angle C_1BA = \omega$ and $\angle CBA_1 = \angle A_1CB = \delta$. The lines AA_1 , BB_1 and CC_1 are concurrent or parallel if and only if

$$\sin(\omega + \alpha) \cdot \sin(\varphi + \gamma) \cdot \sin(\beta + \delta) = \sin(\omega + \beta) \cdot \sin(\varphi + \alpha) \cdot (\delta + \gamma) \Leftrightarrow \\ \sin(\varphi - \omega) \cdot \cos(2\alpha - \delta) + \sin(\omega - \delta) \cdot \cos(2\beta - \varphi) + \sin(\delta - \varphi) \cdot \cos(2\gamma - \omega) = 0$$

Proof:

Let us consider the case

$$\sin(\omega + \alpha) \cdot \sin(\varphi + \gamma) \cdot \sin(\beta + \delta) \cdot \sin(\omega + \beta) \cdot \sin(\varphi + \alpha) \cdot (\delta + \gamma) = 0$$

Let $\sin(\omega + \alpha) = 0$. Since a triangle $\triangle ABC$ is nondegenerated, thus $\omega + \alpha \neq 0$ so we have

$$\omega + \alpha \in \{\pi, 2\pi\}.$$

Let $\omega + \alpha = \pi$, then $\angle BAC_1 + \angle CAB = \pi$, which means C_1 lies on the extension of the line CA such that A is between the points C and C_1 . Since $\angle BAC_1 = \angle C_1BA$, $BA = \omega = \pi - \alpha$ then we have $2(\pi - \alpha) < \pi \Rightarrow \alpha > \frac{\pi}{2}$. Let AA_1 and CC_1 meet at A then BB_1 also contains the point A . Thus B_1 lies on the line AB . Since $\angle ACB_1 = \angle B_1AC = \varphi$, B_1AC , and $\alpha > \frac{\pi}{2}$, then A is between the points B and B_1 . Now we have $\angle ACB_1 = \angle B_1AC = \varphi = \omega$ so we have

$$\varphi + \alpha = \pi \Rightarrow \sin(\varphi + \alpha) = 0 \Rightarrow$$

$$\sin(\omega + \alpha) \cdot \sin(\varphi + \gamma) \cdot \sin(\beta + \delta) = 0 = \sin(\omega + \beta) \cdot \sin(\varphi + \alpha) \cdot (\delta + \gamma)$$

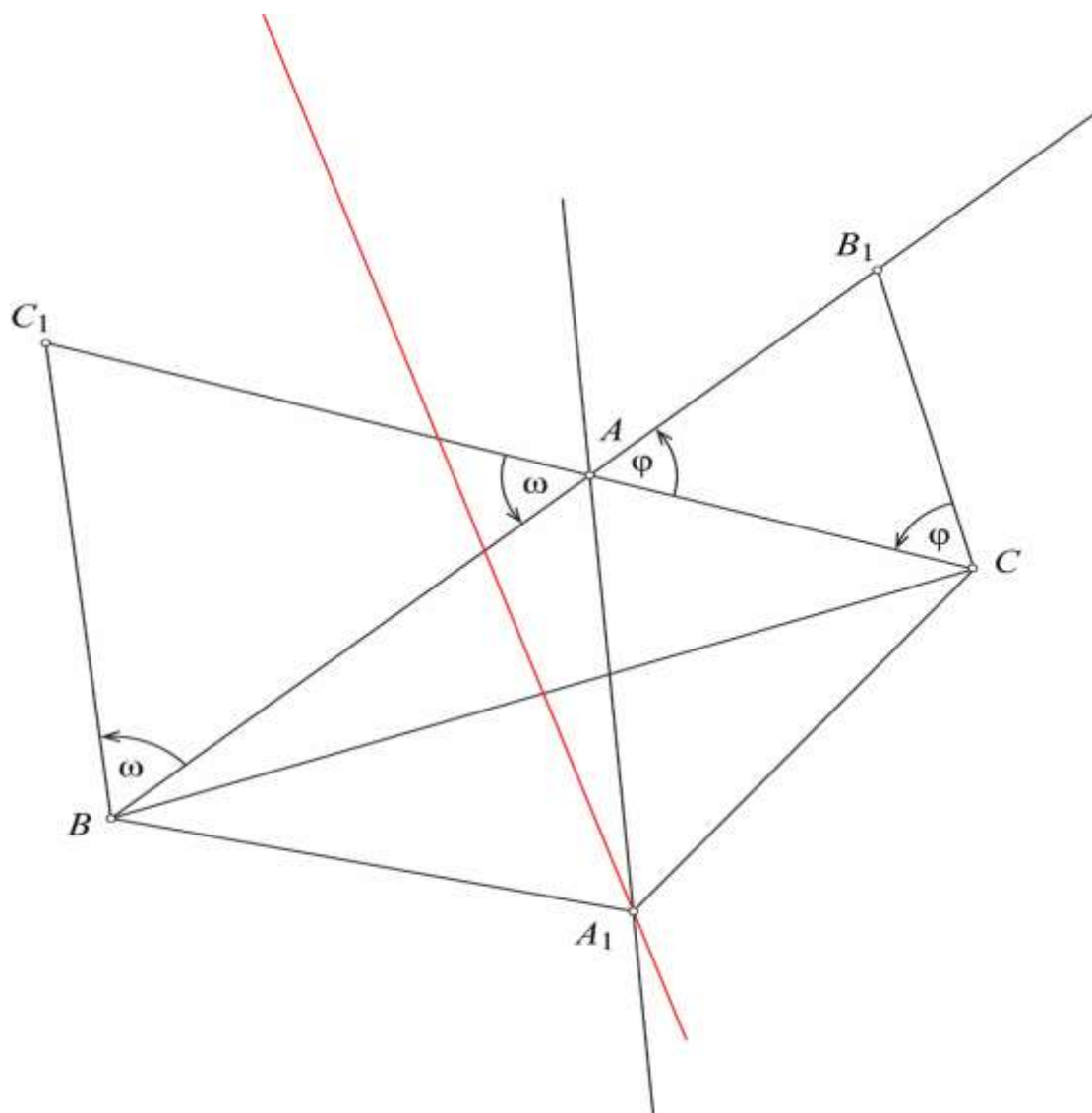


Figure 1.

Then A_1 is any point on the bisector of the segment BC . point of a line through B parallel to CA and the bisector of the segment CA .
 Let AA_1 be parallel to CC_1 , then A_1 lies on the line CA .
 If BB_1 is also parallel to CC_1 then B_1 is an intersection

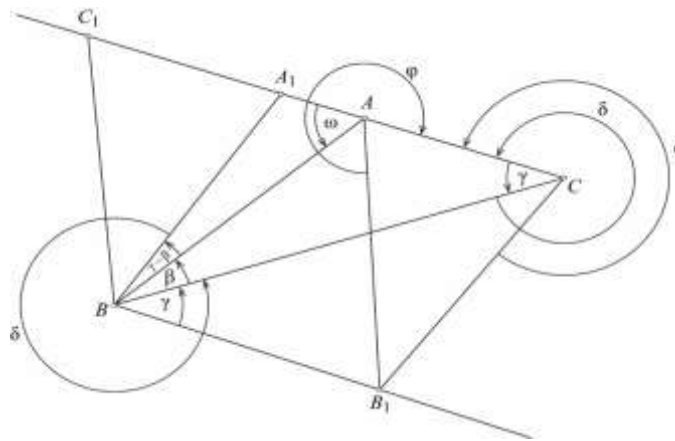


Figure 2.

But then we have

$$\angle A_1CB + \angle BCA = 2\pi \Rightarrow \delta + \gamma = 2\pi \Rightarrow \sin(\delta + \gamma) = 0 \Rightarrow$$

$$\sin(\omega + \alpha) \cdot \sin(\varphi + \gamma) \cdot \sin(\beta + \delta) = 0 = \sin(\omega + \beta) \cdot \sin(\varphi + \alpha) \cdot (\delta + \gamma)$$

Let $\omega + \alpha = 2\pi$ so the point C_1 is on the line CA such that C and C_1 are on the same side of the point A . But then we have

$$\angle BAC_1 = \angle C_1BA \Rightarrow 2\pi - \angle BAC_1 = 2\pi - \angle C_1BA \Rightarrow$$

$$\angle C_1AB = \angle ABC_1 \Rightarrow \alpha < \frac{\pi}{2}. \text{ Let } CC_1 \text{ and } AA_1 \text{ meet at the point } A. \text{ Then } BB_1 \text{ contains the point}$$

A only if B_1 is on the line BA . Then we have

$$\angle B_1AC = \angle BAC_1 \Rightarrow \varphi = \omega \Rightarrow \varphi + \alpha = 2\pi \Rightarrow \sin(\varphi + \alpha) = 0 \Rightarrow$$

$$\sin(\omega + \alpha) \cdot \sin(\varphi + \gamma) \cdot \sin(\beta + \delta) = 0 = \sin(\omega + \beta) \cdot \sin(\varphi + \alpha) \cdot (\delta + \gamma)$$

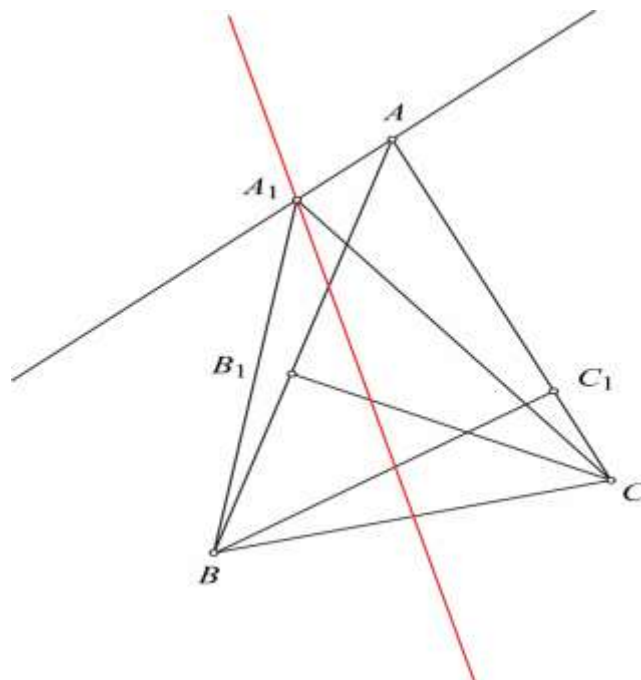


Figure 3.

Let AA_1 be parallel to the line CC_1 , Then BB_1 parallel to them so B_1 is an intersection point of the line through B parallel to AC and the bisector of the segment AC. But then

$$\angle A_1CB + \angle BCA = 2\pi \Rightarrow \delta + \gamma = 2\pi \Rightarrow \sin(\delta + \gamma) = 0 \Rightarrow$$

$$\sin(\omega + \alpha) \cdot \sin(\varphi + \gamma) \cdot \sin(\beta + \delta) = 0 = \sin(\omega + \beta) \cdot \sin(\varphi + \alpha) \cdot (\delta + \gamma)$$

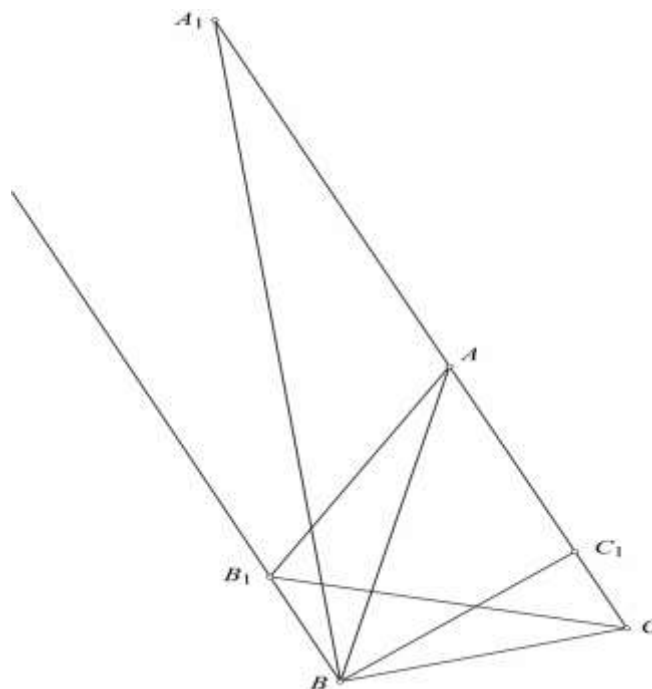


Figure 4.

Similarly we reconsider the cases remained from the equation

$$\sin(\omega + \alpha) \cdot \sin(\varphi + \gamma) \cdot \sin(\beta + \delta) \cdot \sin(\omega + \beta) \cdot \sin(\varphi + \alpha) \cdot (\delta + \gamma) = 0$$

As we can notice, the intersection points of the lines or the point at infinity.

AA_1 , BB_1 and CC_1 are the triangle vertices A, B and C Suppose now that

$$\sin(\omega + \alpha) \cdot \sin(\varphi + \gamma) \cdot \sin(\beta + \delta) \cdot \sin(\omega + \beta) \cdot \sin(\varphi + \alpha) \cdot (\delta + \gamma) \neq 0$$

Consider the points A and A_1 being from distinct sides of a line BC. Let the line AA_1 meet the line BC at the point A'. Let the line through A_1 parallel to BC meet lines AB and AC at the points D and E respectively. From the similarity $\triangle ABC \sim \triangle ADE$ we have

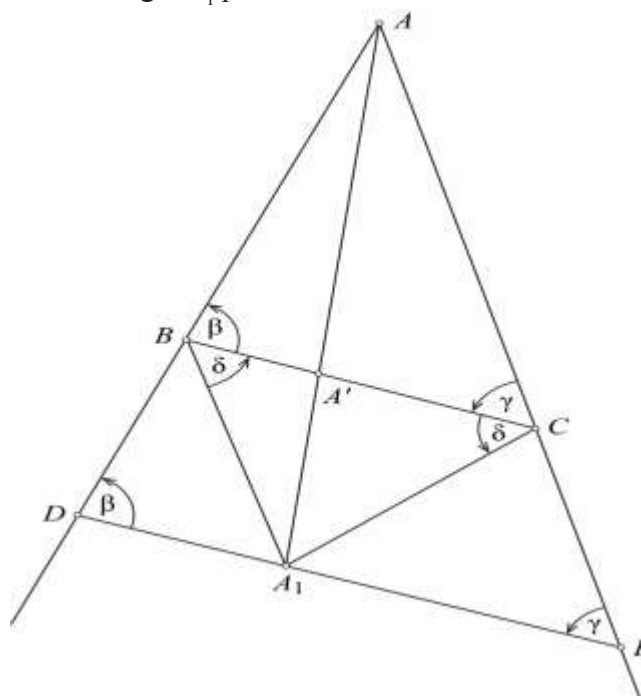


Figure 5.

$$\frac{A_1D}{A_1E} = \frac{BA'}{A'C}$$

From the sine theorem we have

$$A_1D = \frac{A_1B}{\sin\beta} \cdot \sin(\beta + \delta)$$

$$A_1E = \frac{A_1C}{\sin\gamma} \cdot \sin(\gamma + \delta)$$

Dividing we get

$$\frac{BA'}{A'C} = \frac{\sin\gamma}{\sin\beta} \cdot \frac{\sin(\beta + \delta)}{\sin(\gamma + \delta)}$$

Let now A and A_1 be from the same side of the line BC . Let the line AA_1 meet the line BC at the point A' . Let the line through A_1 parallel to BC meet lines AB and AC at the points D and E respectively. From the similarity $\triangle ABC \sim \triangle ADE$ we have

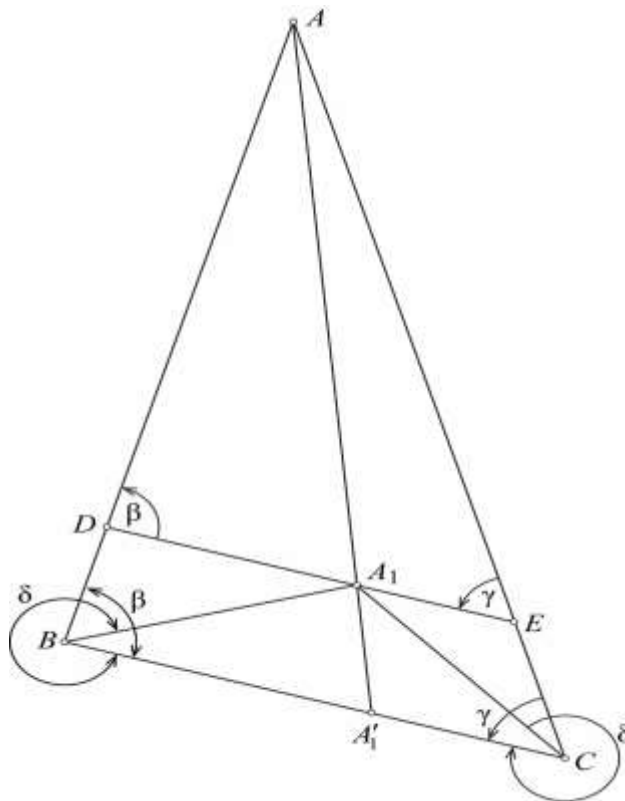


Figure 6.

$$\frac{A_1D}{A_1E} = \frac{BA'}{A'C}$$

From the sine theorem we have

$$A_1D = \frac{A_1B}{\sin\beta} \cdot \sin(\beta + \delta - 2\pi)$$

$$A_1E = \frac{A_1C}{\sin\gamma} \cdot \sin(\gamma + \delta - 2\pi)$$

Dividing we get

$$\frac{BA'}{A'C} = \frac{\sin\gamma}{\sin\beta} \cdot \frac{\sin(\beta + \delta)}{\sin(\gamma + \delta)}$$

So in any case we have

$$\frac{BA'}{A'C} = \frac{\sin\gamma}{\sin\beta} \cdot \frac{\sin(\beta + \delta)}{\sin(\gamma + \delta)}$$

Let us define the points B' and C' similarly. By Ceva's theorem (Kedlaya, 1999) the lines AA_1, BB_1 and CC_1 meet at the point or are parallel if and only if

$$\frac{BA'}{A'C} \cdot \frac{CB'}{B'A} \cdot \frac{AC'}{C'B} = 1 \Leftrightarrow \frac{\sin(\beta + \delta) \cdot \sin(\varphi + \gamma) \cdot \sin(\omega + \alpha)}{\sin(\gamma + \delta) \cdot \sin(\varphi + \alpha) \cdot \sin(\omega + \beta)} = 1 \Leftrightarrow$$

$$\sin(\varphi - \omega) \cdot \cos(2\alpha - \delta) + \sin(\omega - \delta) \cdot \cos(2\beta - \varphi) + \sin(\delta - \varphi) \cdot \cos(2\gamma - \omega) = 0$$

CONSEQUENCES WHEN $\delta = \varphi = \omega$

Corollary 1. On the sides of a nondegenerated triangle $\triangle ABC$ are constructed regular n -gons outwardly, $AC_2 \dots C_{n-1}B, BA_2 \dots A_{n-1}C$ and $CB_2 \dots B_{n-1}A$. Let C_1, A_1 and B_1 be the centers of those polygons respectively. Then the lines AA_1, BB_1 and CC_1 concur.

Proof:

Since the triangles $\triangle AC_1B, \triangle BA_1C$ and $\triangle CB_1A$ are isosceles triangles constructed on the sides of nondegenerated triangle $\triangle ABC$ and $\delta = \varphi = \omega = \frac{n-2}{2n}\pi$, applying the theorem 1 in its second equivalent form directly implies the claim.

Corollary 2. On the sides of a nondegenerated triangle $\triangle ABC$ are constructed regular $2n+1$ -gons outwardly, $AC_2 \dots C_{2n}B, BA_2 \dots A_{2n}C$ and $CB_2 \dots B_{2n}A$. Then the lines AA_{n+1}, BB_{n+1} and CC_{n+1} concur.

Proof:

Since the triangles $\triangle AC_{n+1}B, \triangle BA_{n+1}C$ and

$\triangle CB_{n+1}A$ are isosceles triangles constructed on the sides of nondegenerated triangle $\triangle ABC$ and $\delta = \varphi = \omega = \frac{n-1}{2n}\pi$ applying the theorem 1 in its second equivalent form directly implies the claim.

Corollary 3. On the sides of a nondegenerated triangle $\triangle ABC$ are constructed regular $2n$ -gons outwardly, $AC_2 \dots C_{2n-1}B, BA_2 \dots A_{2n-1}C$ and $CB_2 \dots B_{2n-1}A$. Let C_1, A_1 and B_1 be the midpoints of the sides A_nA_{n+1}, B_nB_{n+1} and C_nC_{n+1} respectively. Then the lines AA_1, BB_1 and CC_1 concur.

Proof:

Since the triangles $\triangle AC_1B, \triangle BA_1C$ and $\triangle CB_1A$ are isosceles triangles constructed on the sides of nondegenerated triangle $\triangle ABC$ and $\delta = \varphi = \omega$, applying the theorem 1 in its second equivalent form directly implies the claim. The corollaries obviously hold when the polygons are constructed inwardly.

Let us just draw the case when all the triangles are outwardly

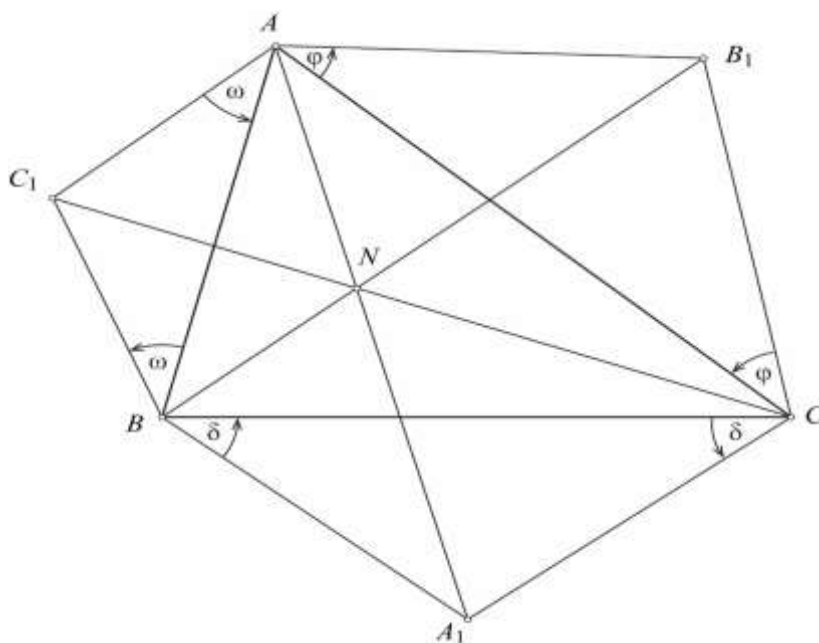


Figure 7.

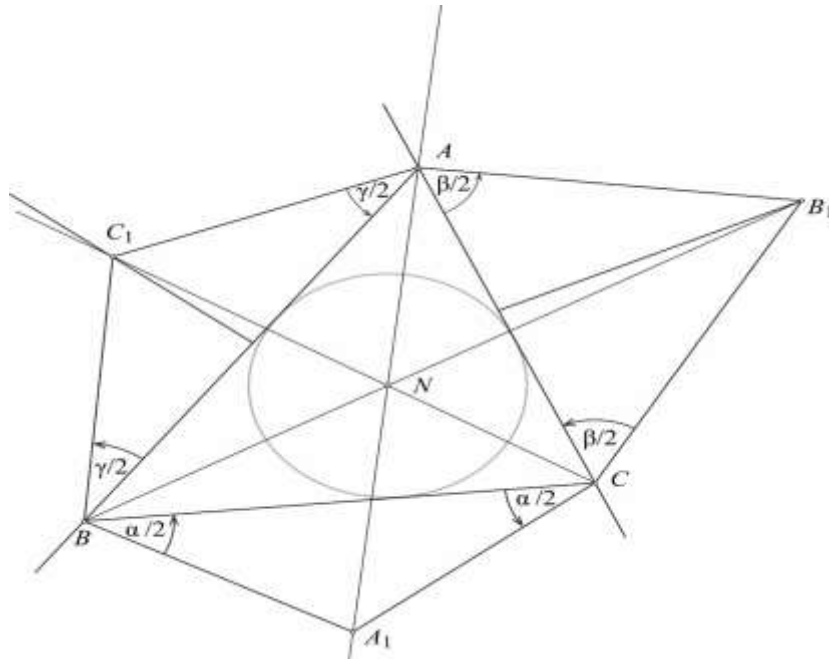


Figure 8.

This is the special case when the lines meet at the in-center.

Then below is the special case when the lines meet at Fermat-Torricelli point (Prasolov, 2001)

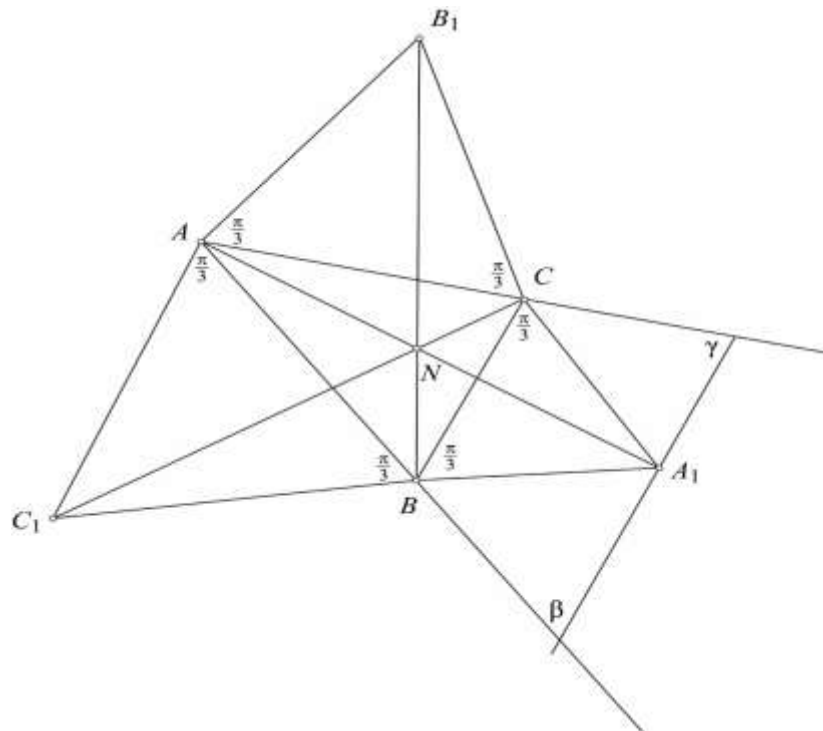


Figure 9.

CONCLUSION

Any point in the plane of nondegenerated triangle can be constructed using this method except the points belonging to the altitudes of the triangle excluding its vertices which can be constructed. This fact is obvious, any point can be connected to the vertices of a triangle, thus forming a line. The intersections of those three lines with the bisectors of the sides op-

posing to the vertices respectively, form three vertices of required isosceles triangles, which is not the case only if the one of the points lie on the line containing the altitude. Then connecting this point to the vertex form a line parallel to the bisector of the opposing side, hence these two lines don't meet. So there is no required isosceles triangle. Also we can see that if the point is constructible this way, then the way of construction is unique.

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