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## SERBIAN ADAPTATION OF THE PSYCHOLOGICAL MINDEDNESS SCALE - PSYCHOLOGY STUDENTS SAMPLE

*Original scientific paper*

Ivan Anđelković<sup>1</sup>

<sup>1</sup>*Department of Social Policy and Social Work, Faculty of Philosophy, University of Nis, Republic of Serbia*

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### ABSTRACT

*The purpose of this research was to evaluate the quality criteria and the factor structure of the Serbian translation of the Psychological Mindedness Scale (PMS) (Shill and Lumley, 2002). In this paper we offer the detailed description of the translation and validation procedures we followed. Psychological Mindedness outlines the interest as well as the ability of an individual to introspectively reflect on emotions and conflicts. The sample consisted of 166 university students. Results indicate good psychometric properties. Internal consistency is good. Explorative factor analysis suggested that a four factor solution is better than the original five factor, because of fewer cross-loadings and better content validity of the factors. Good convergent validity was demonstrated by a strong negative correlation between the whole PMS, and all four factors separately, and Toronto Alexithymia Scale (TAS-20). Perspectives for further improvement of the instrument and its application in therapeutic process are discussed in the conclusion.*

**Keywords:** Psychological Mindedness, Self-report measures, Translation, Validation

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<sup>1</sup> **Correspondence to:**

Ivan Anđelković Department of Social Policy and Social Work, Faculty of Philosophy, University of Nis, Republic of Serbia  
Cirila i Metodija 2, 18000 Nis, Republic of Serbia  
Email: ivan.andjelkovic@filfak.ni.ac.rs

## INTRODUCTION

Psychological Mindedness (PM) is one of the many concepts developed by psychologists, psychiatrists, or philosophers which in their essence refer to the human ability, and willingness to reflect about oneself. Along with introspection, metallization, or mindfulness, the concept of psychological mindedness represents the unique attitude of a human being to be the subject and the object of his own thinking. The purpose of this paper is to present the concept of Psychological Mindedness, to inform the reader about previous attempts of operationalizing the concept, and to discuss the validation results of the Serbian translation of the Psychological Mindedness Scale (PMS).

## DEFINITION AND OPERATIONALIZATION OF THE CONCEPT

The concept of Psychological Mindedness first appeared in literature in the first half of the twentieth century. Its roots can be found in psychodynamic theory, or more precisely, according to Boylan (2006) in Jung's "introversion", Murray's "intraception", and James' "tendermindedness". Apelbaum (1973) states that, due to its similarity, PM is often used synonymously with the concepts of introspection, self-awareness, insight, and reflection. The same author gave the most influential definition of PM as "a person's ability to see relationships among thoughts, feelings, and actions, with the goal of learning the meanings and causes of his experience and behaviour" (1973, p.36). At least four dimensions can be differentiated in this definition: 1) the ability to find causes and motives that underlie the behaviour; 2) the curiosity and interest in the way human mind works, taking both cognitive and emotional part of mental functioning into account; 3) self-directed thinking; 4) the ability to use psychological thinking in the context of psychotherapy.

Later redefining of the concept (Giromini, et al., 2015; Hall, 1992; McCallum & Piper, 1990) expanded the meaning of Psychological Mindedness.

The dimensions included to the concept refer to 1) the interest in others, not only oneself; 2) understanding the connection between intrapsychic processes and difficulties – symptoms manifested in behaviour; 3) willingness to comprehend and change motivational forces which drive human behaviour.

Authors who do not belong to the psychoanalytic orientation only recently encountered the concept of Psychological Mindedness. Grant (2001) adjusted the definition of PM to the cognitive-behavioural perspective. He sees Psychological Mindedness as a meta-cognition, a predisposition to engage in acts of affective and intellectual inquiry into how and why people behave, think and feel in the way they do.

Finally, we will cite the definition of PM given by the authors of the Psychological Mindedness Scale, which validation on the Serbian sample is the main topic of this paper. Its authors Conte, Ratto, and Karusa (1996), offered a definition from a "trans-theoretical" methodology-based perspective. They define PM as "an attribute of an individual that presupposes a degree of access to one's feelings, a willingness to try to understand oneself and others, a belief in the benefit of one's own problems, and interest in the meaning and motivation of one's own and others, thoughts, feelings, behavior and capacity for change," according to Boylan (2006, p. 15).

## PSYCHOLOGICAL MINDEDNESS SCALE

Before we describe the Psychological Mindedness Scale, we would like to mention that this scale is not the only instrument created to measure Psychological Mindedness. Some of the instruments used for this purpose, and cited in literature include Psychological Mindedness Assessment Procedure (PMAP; McCallum & Piper, 1990) and Balanced Index of Psychological Mindedness (BIPM; Nyklicek & Denollet, 2009). The first one operationalizes PM as a participant's understanding of the problem presented by two patients on a video tape. The second is a 14-item self-report scale, which measures the person's interest and ability to be in touch with and reflect on his mental contents.

There are two reasons why we chose Psychological Mindedness Scale for our study. Firstly, PMS has already been used in a number of studies on different samples (clinical and community), and secondly, there are two other versions of the scale (Bulgarian and German) that are being developed simultaneously, which will give us the opportunity in the near future to compare our results with these studies. The 45 items of the scale are given in the Appendix.

PMS is a 45-item scale, constructed primarily to measure the aptitude of a patient for psychodynamic psychotherapy (Conte, et al., 1996). Although its authors belong to the psychodynamic background, the scale itself was not constructed so that it operationalizes any psychodynamic variable. On the contrary, it represents an integration of various definitions of Psychological Mindedness (Boylan, 2006).

The authors of the scale (Conte, et al., 1996) conducted a factor analysis (PCA, with varimax rotation) on the sample of 256 psychiatric patients. They chose a five-factor solution, which explains 38% of the variance, and includes 27 out of 45 items. They labeled the factors as follows:

- I. Willingness to try to understand oneself and others (10 items)
- II. Openness to new ideas and capacity for change (5 items)
- III. Access to one's feelings (5 items)
- IV. Belief in the benefits of discussing one's problems (3 items)
- V. Interest in meaning and motivation of own and others' behavior (4 items)

Shill and Lumley (2002) conducted a research on the sample of 397 students of psychology, aiming to replicate the original factor structure on a community sample. By extracting five factors, loaded by 21 items, they explained 30% of the variance. The labels of the factors were kept the same, but they appeared in a different order:

- I. Belief in benefits of discussing one's problems (7 items)
- II. Access to feelings (4 items)
- III. Willingness to discuss problems with others (3 items)

IV. Interest in meaning and motivation of own and others' behavior (3 items)

V. Openness to change (4 items)

In order to test convergent validity, these authors found significant negative correlation between PMS and alexithymia, measured by TAS-20 (Bagby, Taylor, Parker, 1994).

## **METHODS**

### **Purpose of the study**

The purpose of this study was to evaluate reliability and validity of the Serbian version of PMS.

### **Sample**

Our sample consisted of 166 undergraduate students of psychology from the Faculty of Philosophy in Niš. There were 145 female and 21 male participants. The average age was 21, ranging from 19 to 30.

### **Instruments**

PMS-S (Psychological Mindedness Scale – Serbian version) consists of 45 items. Items are ranged on four-point Likert scale from 1 – strongly disagree to 4 – strongly agree.

TAS-20 (Toronto Alexithymia Scale) consists of 20 items ranged on a five-point Likert scale from 1 – absolutely incorrect to 5 – absolutely correct. The scale comprises the three factors “difficulty identifying feelings”, “difficulty describing feelings” and “externally oriented thinking”. In this study TAS-20 was used as a measure for the convergent validity of PMS.

### **Procedure**

The translation process of PMS included the following: three independent translators translated the scale from English to Serbian; the final version was agreed upon after the discussion; back-translation followed by a professional translator who hasn't seen the scale previously; by comparing this with the original version we concluded that the scale was translated adequately.

## RESULTS

### Reliability

Cronbach's alpha of the PMS-S on our sample was  $\alpha = .83$ , indicating good internal consistency. The TAS-20 (Bagby et al., 1994) also showed good internal consistency, Cronbach's alpha was ( $\alpha = .84$ ).

### Factor structure

Following previous studies (Conte et al., 1996; Shill & Lumley, 2002; Takagishi et al. 2014), we used Principal component analysis with varimax rotation for factor extraction. This resulted in a 15-factor solution explaining 65.1 % of variance. After considering the scree-plot and cross-loadings we conducted another PCA with a forced 4-factor solution.

Table 1. 4-factor-solution of Serbian PMS after PCA with varimax-rotation.

Factor	Eigenvalue	Explained variance	Number of loading items ( $\geq 0.4$ )	Item numbers	Cronbachs $\alpha$
1	4.8	10.7 %	11	34,28,4,31,12,16, 10,22,37,1,35	.79
2	3.36	7.5 %	7	23,5,39,43, 17,38,41	.64
3	3.24	7.2 %	8	29,33,2,15,26,8, 40,32	.66
4	2.95	6.6 %	6	36,6,27,14,24,30	.71

The four factors with 32 items with factor loadings greater than 0.4 are presented in Table 1. All together the four factors explain 32% of the variance. We labelled the factors according to the previous nomenclature and the content of the items: the first factor was labelled "Belief in the benefits of discussing one's problems", the second factor "Access to feelings", the third "Interest in meaning and motivation of own and others' behaviour" and the fourth "Openness to new ideas (and capacity for change)". For the sake of easier comparison of factor structures from the previous studies with our results Table 2 shows the excluded factors, number of items which load the factors and the percentage of explained variance. We see that factors Belief in the benefits of discussing one's

problems and Interest in meaning and motivation of own and others' behavior in our study contain all of the items which load these factors in other two studies (the only exception is the item 9, which loads the factor Interest in meaning and motivation of own and others' behaviour in the first study). There is a high level of overlap in the case of the factor Openness. We may conclude that these three factors are conceptually similar in all three studies. In case of the factor Access, we can notice that this factor in our study represents the combination of two separate factors from the previous studies – Access and Willingness. This distribution of items is logical, since we chose a four-factor solution in our study instead of five-factor solutions from the other two studies.

Table 2. Comparison of Factors composition of PMS in Three studies

	Name and № of factor in studies	Explained variance	Number of items	Items
1	Willingness 1	n.r	10	7, 10, 13, 25, 37, 38, 39, 41, 42,
2	Willingness (3)	5.3%	3	43
3	Willingness			25, 37, 41
1	Openness 2	n.r	5	12, 26, 27, 30, 31
2	Openness (5)	4.8%	4	6, 24, 27, 30
3	Openness (4)	6.6%	6	36, 6, 27, 14, 24, 30
1	Access 3	n.r	5	5, 11, 17, 23, 35
2	Access (2)	5.7%	4	5, 11, 23, 35,
3	Access (2)	7.5%	7	23, 5, 39, 43, 17, 38, 41
1	Benefits 4	n.r	3	4, 28, 34
2	Benefits (1)	9.01%	7	4, 10, 16, 22, 28, 34, 31
3	Benefits (1)	10.7%	11	34, 28, 4, 31, 12, 16, 10, 22, 37, 1, 35



	Name and № of factor in studies	Explained variance	Number of items	Items
1	Interest 5	n.r.	4	2, 8, 9, 29
2	Interest (4)	5.1%	3	2, 26, 32
3	Interest (3)	7.2%	8	29, 33, 2, 15, 26, 8, 40, 32
1	Total	38%		
2	Total	30%		
3	Total	32%		

Studies: 1 PMS Study Conte et al. (1996); 2 PMS Study Shill & Lumley (2002); 3 Present PMS study (Srb sample)

### Convergent validity

The total scores of PMS and TAS-20 correlated strongly negatively with  $r = -.67$ ,  $p < .01$ . The correlations with the found PMS factors (see below)

are presented in table 3. All four factors correlated significantly with TAS-20. Among them, the second PMS factor (Access to feelings) correlated most strongly with the TAS-20.

Table 3. Correlations of PMS and its four subscales with TAS-20.

	PMS total	Belief	Access	Interest	Openness
TAS-20	-.67**	-.49**	-.67**	-.24**	-.36**

\*\* $p < .01$

### DISCUSSION

The goal of this study was to test the reliability, factor structure and convergent validity of the Serbian version of Psychological Mindedness Scale. The results indicate that PMS-S is a valid instrument for measuring Psychological Mindedness on the Serbian population. The reliability (internal consistency) is good. The factor analysis showed that in our case the four-factor solution is better than the five-factor solution from the two American studies. The results from yet another study conducted in Japan (Takagishi, Uji, Adachi, 2014), which tested the validity of the scale on their sample, point out that this solution for the factor structure is not a problem. These authors also extracted four factors, and reported on high level of similarity in items which are loading the factors in their study and the two American studies. Due to the percentage of explained variance, as well as the number of items which load the factors, we may conclude that the factor structures presented in all of the studies are similar. Good convergent validity was confirmed by a high negative correlation between the whole PMS-S, as well as its factors separately, and the TAS-20.

Since the number of items which load the extracted factors in all the studies presented is relatively small (27, 21, 32, out of 45) the question of shortening the instrument can be raised. A shorter version of this scale would be more suitable in psychotherapeutic context, both in case of deciding which therapeutic modality would be most suitable for the person, and in case of assessment of the therapeutic progress. Filling out of a shorter instrument takes less time, doesn't influence the contact between the client and the therapist, and takes less effort for the usually disturbed person who just decided to start with psychotherapy. Future research which aims to develop the PMS could analyze the psychometric characteristics of a shorter version of this scale.



## Appendix

### Psychological Mindedness Scale

1. I would be willing to talk about my personal problems if I thought it might help me or a member of my family.
2. I am always curious about the reasons people behave as they do.
3. I think that most people who are mentally ill have something physically wrong with their brain.
4. When I have a problem, if I talk about it with a friend, I feel a lot better.
5. Often I don't know what I'm feeling.
6. I am willing to change old habits to try a new way of doing things.
7. There are certain problems which I could not discuss outside my immediate family.
8. I often find myself thinking about what made me act in a certain way.
9. Emotional problems can sometimes make you physically sick.
10. When you have problems, talking about them with other people just makes them worse.
11. Usually, if I feel an emotion, I can identify it.
12. If a friend gave me advice about how to do something better, I'd try it out.
13. I am annoyed by someone, whether he is a doctor or not, who wants to know about my personal problems.
14. I find that once I develop a habit, it is hard to change, even if I know there is another way of doing things that might be better.
15. I think that people who are mentally ill often have problems which began in their childhood.
16. Letting off steam by talking to someone about your problems often makes you feel a lot better.
17. People sometimes say that I act as if I'm having a certain emotion (anger, for example) when I am unaware of it.
18. I get annoyed when people give me advice about changing the way I do things.
19. It would not be difficult for me to talk about personal problems with people such as doctors and clergymen.
20. If a good friend of mine suddenly started to insult me, my first reaction might be to try to understand why he was so angry.
21. I think that when a person has crazy thoughts, it is often because he is very anxious and upset.
22. I've never found that talking to other people about my worries helps much.
23. Often, even though I know that I'm having an emotion, I don't know what it is.
24. I like to do things the way I've done them in the past. I don't like to try to change my behavior much.
25. There are some things in my life that I would not discuss with anyone.
26. Understanding the reasons you have deep down for acting in certain ways is important.
27. At work, if someone suggested a different way of doing a job that might be better, I'd give it a try.
28. I've found that when I talk about my problems to someone else, I come up with ways to solve them that I hadn't thought of before.
29. I am sensitive to the changes in my own feelings.
30. When I learn a new way of doing something, I like to try it out to see if it would work better than what I had been doing before.
31. It is important to be open and honest when you talk about your troubles with someone you trust.
32. I really enjoy trying to figure other people out.
33. I think that most people with mental problems have probably received some kind of injury to their head.
34. Talking about your worries to another person helps you to understand problems better.
35. I'm usually in touch with my feelings.
36. I like to try new things, even if it involves taking risks.
37. It would be very difficult for me to discuss upsetting or embarrassing aspects of my personal life with people, even if I trust them.
38. If I suddenly lost my temper with someone, without knowing exactly why, my first impulse would be to forget about it.
39. I think that what a person's environment (family, etc.) is like has little to do with whether he develops mental problems.
40. When you have troubles, talking about them to someone else just makes you more confused.
41. I frequently don't want to delve too deeply into what I'm feeling.
42. I don't like doing things if there is a chance that they won't work out.
43. I think that no matter how hard you try, you'll never really understand what makes people tick.
44. I think that what goes on deep down in a person's mind is important in determining whether he will have a mental illness.
45. Fear of embarrassment or failure doesn't stop me from trying something new.

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## CHARACTERISTICS OF ADULT PEOPLE WITH FLUENCY DISORDER

*Original scientific paper*

**Isidora Radonjić<sup>a</sup>**

**Nada Dobrota Davidović<sup>a</sup> (Ret.)**

**Danka Radulović<sup>a</sup>**

**Jadranka Otašević<sup>a</sup>**

**Darinka Šoster<sup>b</sup>**

**Dragomir Davidović<sup>c</sup>**

<sup>a</sup> Faculty of Special Education and Rehabilitation, University of Belgrade, Republic of Serbia

<sup>b</sup> Institute of Psychophysiological Disorders and Speech Pathology "Prof. Dr. Cvetko Brajović", Belgrade, Republic of Serbia

<sup>c</sup> Clinic for psychiatric diseases "Dr Laza Lazarević", Belgrade, Republic of Serbia

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### ABSTRACT

*The aim of this study is to test the thesis that adults who stutter differ from those without this disorder by lower birth weight and in terms of personality dimensions, as well as the assertion that prevalence of stuttering is far higher among males. Total sample consisted of 108 subjects, aged 18 - 50, whereby subsamples consisted of 54 subjects, equaled in gender and age. The Personality Inventory NEO PI\_R (S/A form) was used to examine basic personality dimensions (Neuroticism, Extraversion, Openness, Agreeableness and Conscientiousness). The correlation between the gender and stuttering has been established, but no differences have been found between the birth weights or in terms of basic personality characteristics. Further examinations are needed but such should be applied to larger representative samples, using more progressive data processing methodology.*

**Key words:** fluency disorders, stuttering, personality dimensions, gender, birth weight

<sup>1</sup> **Correspondence to:**

Jadranka Otašević, Faculty of Special Education and Rehabilitation, University of Belgrade, Republic of Serbia  
Visokog Stevana 2, Belgrade, Republic of Serbia  
Phone: +381693550337  
E-mail: jadrankastevovic@yahoo.com

## INTRODUCTION

Most commonly, when thinking about fluency, one usually means fluid, effortless speech without any interruptions, repetitions or prolongations of syllables. On the other hand, speech disfluency involves incorrect pronunciation; with speech rhythm and tempo are excessively disturbed as some of the basic supra-segmental speech structures. Fluency disorder is a pathological state that can appear both among children and adults. Pathological states having fluency disorder as their syndrome include: tachyphemia or rapid speech syndrome, palilalia, apraxia, parkinsonism, spasmodic dysphonia, Tourett's syndrome, neurogenic stuttering, but also stuttering manifested in disorders of all fluency forms with prominent changes in somatic, psychological and social sphere, which are all subjects of the present study. The most prominent stuttering symptom is a complicated and interrupted verbal communication with disturbed feedback. When it comes to the prevalence, stuttering is the second speech- language disorder, present among all ages, but most frequently between the age of 2 and 3, and between 4 and 5 years of age (Dobrota, Otašević, & Radević, 2018).

Epidemiological data reveal that correlation between the gender and speech pathology is important for understanding this matter, since speech-language disorders are substantially more prevalent among men than women. Yairi and Ambrose find this proportion to be 3:1 (Yairi & Ambrose, 2013).

Researches indicate that birth weight is one of the risk factors for atypical neurological (Walhovd et al., 2012) and psychosocial development (Rygaard, 1998 according to Radulović, 2006). Boulet and associates (Boulet, Schieve, & Boyle, 2011) established correlation between birth weight and stuttering, but the empirical data concerning this subject are still inconsistent (McAllister & Collier, 2014).

The etiology of disfluent speech has been in focus of numerous scientists for many years now. The relevant etiological factors comprise genetic predispositions, neurologic deficits and psychological factors, either individually or as combination thereof.

During the first half of the 20<sup>th</sup> century, the most common opinion was that stuttering was related to various forms of pathology, presence of neuroticism and unconscious personality conflicts (Bloodstein & Bernstein-Ratner, 2008). More recent studies give greater significance to a combination of genetic and neurophysiological factors influencing the speech and language production, potentially resulting in stuttering (Cykowski, Fox, Ingham, Ingham, & Robin, 2010). However, even in this constellation an important aspect of stuttering is the psychological one, so that people with this disorder quite commonly tend to be anxious, quailed, socially isolated, withdrawn, depressed, pessimistic, fearful, prone to phobias – especially to logophobia (Tran, Blumgart, & Craig, 2011). The aggravating factors in treatment of stuttering disorder can include the temper and certain personality traits of a treated person, which build up to and contribute to a negative self-assessment, as well as noticeable psychopathological personality tendencies (Radoman, 2004). The present study therefore addresses, in addition to gender and birth weight, certain basic personality dimensions of adults who stutter and of persons from typical population.

### *Subject and objective of the study*

The subject of the present study is to establish:

- a) gender differences with regard to the prevalence of stuttering;
- b) differences in birth weight between adults who stutter and those from typical population;
- c) differences in personality dimensions between adults who stutter and those without this disorder; and
- d) differences in personality structure between men and women undergoing the speech treatment for their stuttering.

The objective of this study is to verify the not always consistent findings from foreign literature, referred to in the Introduction, about the existence of differences in the stated characteristics between the experimental and control groups, taking into account their significance for the prediction of treatment outcome.

## METHODOLOGY

### Sample

Total sample included 108 respondents between 18 and 50 years of age (Table 1).

Table 1. Sample distribution by age

Group	N	Min	Max	M	SD
Experimental	54	18	47	26.69	6.89
Control	54	18	50	26.67	6.91
Total	108				

The subsamples consisted of 54 respondents in the experimental and the same in the control group, equalized in age and gender (Table 1 and Table 2).

Table 2. Sample distribution by gender

Group/gender	Frequency	Percentage
<i>Experimental</i>		
Male	38	70.4
Female	16	29.6
Total	54	100.0
<i>Control group</i>		
Male	38	70.4
Female	16	29.6
Total	54	100.0

The experimental group of respondents (38 men and 16 women) comprised all adult patients from the Institute for Psychophysiological Disorders and Speech Pathology “Prof. Dr Cvetko Brajović” from Belgrade, who were involved in regular logopedic therapy for fluency disorder in the course of two months, while data gathering for this study took place. The treatment applies complex, comprehensive and empirically verified study developed by Professor Cvetko Brajović, called “Conscious Synthesis of Development (CSD)”. This methodology is regarded as the most efficient and most appropriate one in stuttering treatments (Dobrota, Otašević, & Radević, 2018). The control group of 54 adult respondents from typical population, aged between 18 and 50, who had never expressed any symptoms of stuttering, comprised students of final grades in Mathematical Grammar School, students of final semesters and graduate students of the

University in Belgrade (Faculty of Special Education and Rehabilitation, Faculty of Sport and Physical Education and Faculty of Music), as well as members of scouting and mountaineering organizations.

### Variables and Instruments

The research included variables treated in recent empirical literature as important risk factors when it comes to stuttering: *gender*, *low birth weight* and *basic personality dimensions*. Low birth weight can be an indication for neuropsychological correlates of developmental disorders, including speech pathology; as a reference for low birth weight, a value of less than 2500 g is assumed, determined as per McAllister and Collier (McAllister & Collier, 2014). Data concerning gender and birth weight became available as self-reported by the respondents in a form of anonymous general questionnaire composed of nine questions, including sociodemographic data about the respondents. *Personality variables* were taken from the ‘Big-Five’ model (Digman, 1990), which assumes a hierarchical personality structure defined through the five basic *domains*, i.e. *personality dimensions*: *Neuroticism*, *Extraversion*, *Openness*, *Agreeableness* and *Conscientiousness*, forming the basis of personality traits. The ‘Big-Five’ model is based on the factor analysis of lingual phrases in different cultures. The basis of this model is the notion that individual differences are in essence the differences in the intensity of basic personality dimensions, and that such intensity differentiates between pathological and normal. Personality variables defined in such a way were measured through a shortened version of the verified *Personal Inventory* NEO PI\_R (NEO-FFI) whose authors are Costa and McCrae (Costa & McCrae, 1992) and whose Serbian adaptation (S/A form) was done by Knežević, Đurić-Jočić and Džamonja-Ignjatović (2009). Each dimension is covered in the test with 12 items that examine the underlying personality traits i.e. facets within each dimension. The test contains a total of 60 items formulated as assertions (in Likert’s scale format) within a range between 1 and 5 responded by the respondents of the experimental and control groups in the form of a self-report.



The instrument has good metric characteristics, which can be observed from the reliability coefficients of tests (scales) used for the purpose of measuring the main personality dimensions (Table 3).

*Table 3. Reliability coefficients of the applied Personality Inventory*

Test scales	Reliability coefficient	Reliability type
1. Neuroticism	.75	Cronbach
2. Extraversion	.73	Cronbach
3. Openness	.71	Cronbach
4. Conscientiousness	.69	Cronbach
5. Agreeableness	.69	Cronbach

Knežević, Radović and Opačić (1997) also find that the representativeness of the NEO PI\_R items for each scale remains high, that the scales are reliable and that the homogeneity coefficients are relatively low, so that for this measuring instrument both the factor and the taxonomy validity is confirmed. The Personal Inventory was appraised as very good and of a high quality by the same authors who recommended it for all occasions wherein a reliable assessment of respondent personality structure is needed. However, they deem that one quarter of mainly negatively formulated items should be transformed, since they require unnecessary cognitive efforts of the respondents in solving the double-negation problem (Knežević and associates, 1997). We reassured ourselves of these statements while gathering field data, especially for the experimental group, because some respondents asked for help in interpretation of assertions with double negations.

Nevertheless, NEO PI\_R is one of the best Personality Inventories, also in the opinion of some other authors, measuring individual differences in personality dimensions of healthy people, but also of those with psychopathological tendencies in a form of a self-report (Bleek, Reuter, Yaruss, Cook, Faber & Montag, 2012). Taking that into account, as well as the fact that the instrument is based on the analysis

of expressions used in everyday speech and that it is applied in the research of personal correlates of stuttering by other authors, thus enabling comparison of findings, the Inventory has also been selected for personality assessment in the present study.

## Research procedure

Examination of the experimental group was conducted in March and April 2017 on the premises of the Institute. Following the approval of the Institute Ethics Committee, data gathering and the examination of the experimental group started. Each respondent from the experimental group personally signed the Consent to take part in the research. This Consent contained information about the research objective and statements that the research was anonymous, as well as that the personal data would be used only for scientific purposes and would be protected from any abuse in accordance with the Law on Personal Data Protection (Official Gazette of RS, no. 97/2008, 104/2009 – state law, 68/2012 – CC decision and 107/2012<sup>2</sup>). The signed Consent is attached to the medical record of every member from the experimental group.

The control group members were examined in April 2017.

## Data Processing

The collected data were processed applying methodologies of descriptive and inferential statistics: chi-square test, t-test, Shapiro-Wilk test and U-test.

Negatively reflected items in the NEO PI\_R(S/A form) instrument had been previously recoded applying the “key” and the summary scores on the scales and subscales were derived. The instrument discrimination was examined through Shapiro-Wilk test. The instrument subscales, scores of which significantly deviated from the normal distribution model, were examined through Mann-Whitney test (U-test). For the purpose of checking the internal test reliability, the Cronbach-alpha internal reliability coefficient was used with  $\alpha = .70$  as the limit. All collected data were processed using software package SPSS, version 23.

<sup>2</sup> Official Gazette of RS, no. 97/2008, 104/2009 – state law, 68/2012 – CC decision and 107/2012



## RESULTS

The research has revealed statistically significant difference in the frequency of male population with speech fluency disorder compared to that of female population with the same diagnosis (Table 4).

Table 4. Subsamples distribution by gender

Gender	Experimental group		Control group	Total
	N	N	N	Σ
Male	38	38	76	
Female	16	16	32	
Total	54	54	108	

The results of applying the univariate chi-square test have demonstrated that the observed difference in the frequencies concerning gender as variable category is statistically significant in the experimental group of respondents ( $\chi^2=8.96$  df=1,  $p\leq.01$ ).

Discrepancy in birth weight between the subjects from experimental and control groups (Table 5) was tested applying t – test for independent samples.

Table 5. Arithmetic means and standard deviations on birth weight variable in experimental and control groups

Birthweight	N	M	SD	SEM
Experimental	54	3321.22	786.76	107.06
Control	54	3352.56	770.44	104.84

This test has demonstrated that no statistically significant differences exist in the birth weight between the respondents from the experimental and control groups at the entire sample level: ( $t=-.21$ , df =106,  $p=.84$ ). The average birth weight for the experimental group respondents was 3321.22 g, which substantially exceeds the limit of 2500 g.

The results of the study indicate there are no statistically significant differences in the personality structure between the experimental and control groups (Table

6), nor is there difference in personality dimensions between men and women from the experimental group (Table 7).

Table 6. Arithmetic means and standard deviations on personality variables in experimental and control groups

Personality traits	Group					
	Exp.	Con.	Exp.	Con.	Exp.	Con.
	N	N	M	M	SD	SD
Neuroticism	54	54	2.87	2.72	.71	.54
Extraversion	54	54	3.24	3.28	.53	.47
Openness	54	54	3.33	3.32	.45	.51
Agreeableness	54	54	3.46	3.37	.50	.51
Conscientiousness	54	54	3.82	3.78	.53	.59

The results of t-test applied to independent samples demonstrated no significant differences in personality dimensions (on each subscale) between the experimental and control groups: Neuroticism ( $t=1.25$ , df=106,  $p=.22$ ), Extraversion ( $t=-.48$ , df=106,  $p=.63$ ), Openness ( $t=.06$ , df =106,  $p=.95$ ), Agreeableness ( $t=.89$ , df =106,  $p=.38$ ), Conscientiousness ( $t=.37$ , df = 106,  $p=.71$ ).

Table 7. Arithmetic means and standard deviations on personality variables of men and women within experimental group

Group	Gender	Personality Traits	N	M	SD
Experimental	Men	Neuroticism	38	2.77	.62
		Extraversion	38	3.30	.50
		Openness	38	3.31	.39
		Agreeableness	38	3.40	.49
		Conscientiousness	38	3.86	.51
	Women	Neuroticism	16	3.09	.88
		Extraversion	16	3.10	.61
		Openness	16	3.38	.59
		Agreeableness	16	3.60	.49
		Conscientiousness	16	3.73	.58

The results of t-test applied to independent samples between men and women in terms of personality dimensions in the experimental group demonstrate no statistically significant differences at any subscale:

Neuroticism ( $t=-1.52$ ,  $df=52$ ,  $p=.13$ ), Extraversion ( $t=1.26$ ,  $df=52$ ,  $p=.21$ ), Openness ( $t=-.50$ ,  $df=52$ ,  $p=.62$ ), Agreeableness ( $t=-1.37$ ,  $df=52$ ,  $p=.18$ ) and Conscientiousness ( $t=.80$ ,  $df=52$ ,  $p=.43$ ).

The instrument discrimination was tested by the Shapiro-Wilk test of scores distribution normality (Table 8).

*Table 8. Results of Shapiro-Wilk test application of distribution normality on scores in personality variables for total sample*

	Shapiro-Wilk test		
	W	Df	P
Neuroticism	.98	108	.09
Extraversion	.98	108	.14
Openness	.96	108	.00
Agreeableness	.93	108	.00
Conscientiousness	.97	108	.03

The results of the Shapiro-Wilk test demonstrate statistically significant deviation in the empirical scores distribution on the Openness subscales ( $W=.96$ ,  $p\leq .01$ ), Agreeableness ( $W=.93$ ,  $p\leq .01$ ) and Conscientiousness ( $W=.97$ ,  $p=.03$ ), whereas the scores on the other subscales of personality variables, including neuroticism, are normally distributed.

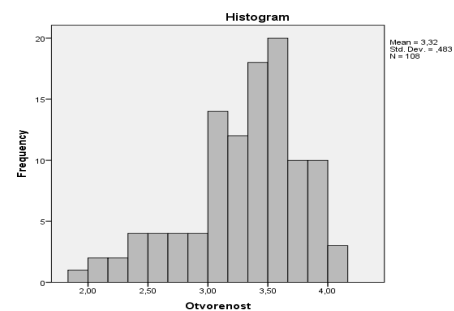
The statistical significance of the horizontal and vertical deviations has also been examined (Table 9).

*Table 9. Arithmetic means, standard deviations and dispersion measures for the distributions of results in personality variables for total sample*

	N	M	SD	Skewness		Kurtosis	
				Stat.	SEsk	Stat.	SEku
Neuroticism	108	2.79	.64	.40	.23	.55	.46
Extraversion	108	3.26	.50	-.32	.23	-.22	.46
Openness	108	3.32	.48	-.71	.23	.23	.46
Agreeableness	108	3.41	.50	-.92	.23	4.65	.46
Conscientiousness	108	3.80	.56	-.34	.23	-.02	.46

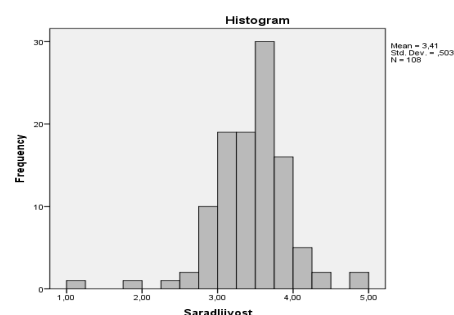
The statistical significance test for the horizontal deviation on the *Openness* subscale (Figure 1)

indicates that standardized skewness equals to -3.09 (skewness=-.71 and SEsk=.23) and  $p\leq .01$ , whereas the statistical significance test for the vertical deviation on the same subscale demonstrates that standardized kurtosis equals to .5 (kurtosis=.23, SEku=.46) and  $p\geq .05$  (negatively asymmetric distribution).



*Figure 1. Scores distribution on the Openness subscale*

The statistical significance test for the horizontal deviation on the *Agreeableness* subscale (Figure 2) demonstrates that the standardized skewness equals to -4 (skewness=-.92 and SEsk=.23) and  $p\leq .01$ , whereas the statistical significance test for vertical deviation on the same subscale indicates that the standardized kurtosis equals to 10.11 (kurtosis=4.65, SEku=.46) and  $p\leq .01$  (negatively asymmetric distribution – leptokurtic curve).



*Figure 2. Scores distribution on the Agreeableness subscale*

The statistical significance test for the horizontal deviation on the Conscientiousness subscale (Figure 3) indicates that the standardized skewness equals to -1.48 (skewness=-.34 and SEsk=.23) and  $p\geq .05$ , whereas the statistical significance test for the vertical deviation on the same subscale demonstrates that the standardized kurtosis equals to -.04 (kurtosis=-.18, SEku=.46) and  $p\geq .05$  (negatively asymmetric distribution – platykurtic curve).

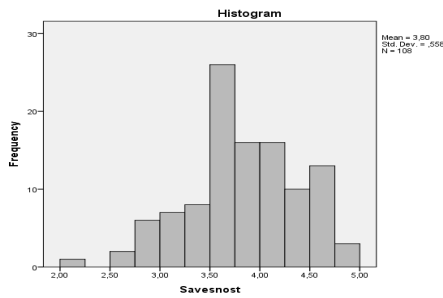


Figure 3. Scores distribution on the Conscientiousness subscale

Since it has been established that the empirical scores distribution concerning personality dimensions indicates significant statistical deviation from the normal one on Openness, Agreeableness and Conscientiousness subscales, the collected data have also been processed applying the non-parametric Mann–Whitney test (Table 10).

Table 10. Medians of experimental and control groups on personality variables (measured by Man-Whitney test)

<i>Personality dimensions</i>	<i>Exp.</i>	<i>Contr.</i>	<i>Exp.</i>	<i>Contr.</i>	<i>Exp.</i>	<i>Contr.</i>
	N	N	Mdn	Mdn	IQR	IQR
Neuroticism	54	54	2.91	2.75	0.77	0.77
Extraversion	54	54	3.25	3.33	0.81	0.67
Openness	54	54	3.42	3.42	0.58	0.69
Agreeableness	54	54	3.50	3.42	0.58	0.58
Conscientiousness	54	54	3.75	3.75	0.71	0.65

The results of the non-parametric Mann-Whitney test (U-test), by the means of which differences in medians are examined, also demonstrate no statistically significant differences in the personality dimensions between the experimental and control groups: Neuroticism ( $U=1300.50$ ,  $p=.33$ ), Extraversion ( $U=1373.00$ ,  $p=.60$ ), Openness ( $U=1425.50$ ,  $p=.84$ ), Agreeableness ( $U=1326.00$ ,  $p=.42$ ) and Conscientiousness ( $U=1436.00$ ,  $p=.89$ ).

Reliability of the applied NEO PI\_R (S/A form) instrument on the examined sample was tested through Cronbach  $\alpha$  index (Table 11).

Table 11. Reliability coefficients for personality subscales of total sample (measured by Cronbach  $\alpha$  index)

<b>Subscale</b>	<b>Reliability coeff. (<math>\alpha</math> index)</b>	<b>(number of items in scales)</b>
Neuroticism	.79	12
Extraversion	.68	12
Openness	.53	12
Agreeableness	.64	12
Conscientiousness	.80	12

Application of the internal consistency test to each particular item on Neuroticism ( $\alpha=.79$ ) and Conscientiousness subscales ( $\alpha=.80$ ) indicate high items interrelations in these subscales, as well as high internal consistency (reliability). The internal items reliability on Extraversion subscale for  $\alpha$  index attains sufficiently high limits ( $\alpha=.68$ ), while internal consistency of Agreeableness items indicates somewhat lower values ( $\alpha=.64$ ), whereas values significantly lower than the limiting ones are found for Openness subscale ( $\alpha=.53$ ).

## DISCUSSION

Applying the basic, descriptive level of analysis and by checking the earlier findings on the correlation between the gender and stuttering, this study sought to verify the inconsistent empirical argumentation of foreign authors who found substantial differences between the adults who stutter and those from typical population without this disorder.

The results of this research regarding the correlation between the *gender* and *stuttering* are in accordance with the earlier studies which have confirmed that stuttering men are two to three times more numerous than women with the same diagnosis (Reilly et al., 2009). According to Yairi and Ambrose, the proportion is 3:1, but the younger the respondents, the lower the proportion (Yairi & Ambrose, 2013). Nevertheless, boys are at significantly higher risk of developing chronic stuttering than girls. The study of Watkins and associates (Watkins, Yairi & Ambrose, 1999) reveals an increasing number of male respondents who stutter in adolescence compared to their early childhood, as well as a higher percentage of spontaneously cured stuttering disorders among women.

It is assumed that statistically significant difference in prevalence of stuttering between the two genders is due to genetic factors, most probably to the influence of brain structures that are connected to speech-language processes (Ambrose, Cox, & Yairi, 1997). For instance, in families where there is a stuttering child, it is more commonly the father that stutters than the mother, and brothers more commonly than sisters. These statements are corroborated by the results of Cox and associates (Cox et al., 2005).

The existence of statistically significant differences in the frequencies between men and women from the experimental group in this research, most likely reflects the real picture of gender structure in the category of stuttering persons; but it is quite likely that spontaneous curing of stuttering among women occurred to certain percentage in their earlier age, so that fewer females request logopedic therapy. This must be studied in more detail and as subject of another study.

*The difference in birth weight between the experimental and control groups* was examined starting from Packman's standpoint that the fundamental cause of stuttering is a neurological deficit (Packman, 2012) and that birth weight is an important risk factor for irregular neurological development (Walhovd et al., 2012). The present results, however, are not in favor of the presence of any statistically significant differences in terms of birth weight between the respondents from the experimental and control groups, although critical birth weight was recorded for a few respondents from the experimental group, but their anamnesis led to the conclusion that they had no neurological defects during the early psychomotor development.

The absence of statistically significant difference in the birth weight between the respondents from the experimental and control groups complies with the findings of Reilly and associates (Reilly et al., 2009) and McAllister and Collier (McAllister & Collier, 2014), but it is contrary to the results of other authors (Walhovd, Fjell, & Brown, 2012; Boulet, Schieve, & Boyle, 2011). So, according to the results of Boulet and associates (2011), the highest risk of stuttering concerns the children born with the lowest weight: a

significant percentage of development disorders and health problems is related to the children born with weight of <3000 g, whereas the risk increases for children born with <2500 g compared to the children with normal birth weight (Boulet, Schieve, & Boyle, 2011). Rygaard (1998, according to the Author, 2006) also warns that the birth weight (too low and too high) has the element of risk to the "early emotional frustration" phenomenon and, consequently, also causes difficulties in verbal functioning.

All these inferences certainly deserve a serious empirical verification within different research projects on larger samples of respondents. The same also applies to the results obtained in relation to the differences between the experimental and control groups on personality variables in this study.

In current empirical records, the most heated debates focus precisely on the *differences in personality characteristics between adults who stutter and those from the typical population*.

Contrary to the authors, who claim there is no reliable evidence about the existence of differences in this domain (Bloodstein & Bernstein-Ratner, 2008; Manning & Beck, 2013), there are authors who prove that such differences exist (Iverach et al., 2009, 2010; Jafari et al., 2014; Bleek, Montag, Faber, & Reuter, 2011). Some authors even make efforts to find argumentation in favor of thesis that personality disorders, as well as other risks that affect mental health, are significantly more common in the case of stuttering people compared to those deprived of any speech dysfunctionality (Iverach et al., 2009).

Starting from the 'Big-Five' model, Jafari and associates (Jafari, Shahbodaghi, Ashayeri, Mohammadreza, & Baziya, 2014), compared the test results (scale of NEO-FFI Inventory) obtained on a sample of 20 adults with disfluent speech from the experimental group, to the results obtained on a sample of the same size of adult respondents from the control group matched by gender and age. They found the presence of statistically significant differences on Neuroticism and Conscientiousness subscales between the two groups, where almost all scores on these dimensions were increased for adults with disfluent speech.

The findings of Bleek and associates (Bleek et al., 2011, 2012) and of Iverach and associates (Iverach et al., 2010) are in favor of increased scores on Neuroticism dimension for adult respondents who stutter, contrary to the control ones. However, their findings are completely contradictory for aspects concerning the other two dimensions: Conscientiousness and Agreeableness, for which both studies find that, in addition to Neuroticism, significantly differentiate stuttering respondents from those from the control group. In fact, Iverach and associates (2010) prove that respondents from the experimental group achieve lower scores on Conscientiousness and Agreeableness subscales compared to normative sample, whereas Bleek and associates (2011) found through the tests of Conscientiousness and Agreeableness in a carefully selected control group (matched by gender, age and absence of stuttering) that scores for stuttering adults are significantly higher than those from the control group. We can therefore conclude that any research require careful selection, not only the experimental group, but also of the control one, in order to establish distinctive characteristics of stuttering people compared to respondents without this disorder (which was conducted in the present study). In another research, conducted on a sample of 112 stuttering people from Germany, Bleek and associates (2012) established that high Neuroticism and Introversion (low Extraversion) have an important indirect influence on stuttering in everyday life and possibly on the treatment. Iverach and associates (2009) report that stuttering increases the risk of personality disorder development (in particular: four to seven times in case of dissocial, anxious, borderline and paranoid personality disorders, i.e. two to three times in case of histrionic, impulsive and anankastic ones). Contrary to the results of all mentioned studies, those of the present one have shown that there are no statistically significant differences as to the basic personality domains between people treated in referent institution and adults from typical population. This finding is also consistent with the findings of other authors who prove that adults who stutter are

neither more neurotic nor more maladjusted than adults without this disorder, as well as that there are no significant differences in personality traits among them (Bloodstein & Bernstein-Ratner, 2008; Manning & Beck, 2013).

Our results are also concordant with the view of authors who claim inconsistency of the records used in the attempt to show that stuttering individuals have specific set of personality traits; actually, there is overlapping between stuttering people and those without this disorder, concerning their personality traits, as well as their adaptation and emotional health (Bloodstein & Bernstein-Ratner, 2008; Manning & Beck, 2013).

Since this research found no differences between the experimental and control groups for Neuroticism dimension, whose important aspect is anxiety, and the subscale itself on the examined sample has a good reliability, it can be concluded that the respondents from our experimental group have no primary anxiety enhanced through basic neurotic structure, as is the case with the respondents from experimental samples of other authors (Iverach et al., 2010; Bleek et al., 2011). Analogously, possible symptoms of anxiety, depression and fear of negative evaluation for adults who stutter from our sample are secondary with respect to the stuttering as such and result from the awareness of difficulties in the communication. Therefore, if they appear, they are reactive in their nature and are not an indication of the enhanced personality trait (from neuroticism domain) compared to those who do not stutter.

As such, these symptoms are reduced with sufficient success by means of a speech therapy, especially if the mentioned method (SSR) is applied. It has been confirmed through practice and the application thereof allows to include both cognitive and behavioral correlates of stuttering (Dobrota, Otašević, & Radević, 2018).



Our research has generated no indications that the risk of psychopathological tendencies and personality disorders of adults who stutter is enhanced compared to the case of fluently speaking people, which is contrary to findings of Iverach and associates (2009) mentioned above, but concords with the results of Manning and Beck (Manning & Beck, 2013) who established on a sample of 50 adult patients undergoing stuttering treatment, that only four patients fulfilled the criteria for one personality disorder, one patient for two personality disorders, whereas the other 90% of respondents did not fulfil the criteria for this diagnosis, i.e. the rates of personality disorders established in the examined sample are approximately equal to those found in the control samples of the general population. Comparing our data to those mentioned earlier indicates that the present results prove that the reports of other scientists in favor of high percentages of personality disorders for the adults who stutter (Iverach et al., 2009) are a consequence of a non-selective use of self-reports, wherein the existence of dysfunctionality within a personality and comorbidity with other disorders are overestimated. For instance, on a sample of 92 respondents, Iverach and associates (Iverach et al., 2009; 2010), found that even 64.1% of them fulfilled the criteria for diagnosing at least one personality disorder, and even 43.44% of the respondents fulfilled the criteria for two or more personality disorders. The most frequent personality disorders were: anxiety (28.26%), impulsiveness (27.17 %) and paranoid disorder (26.09%).

Finally, the present study found no statistically significant *differences in the personality structure of men and women* included in the stuttering treatment, justifying the practice of applying the same approach in rehabilitation of stuttering for both genders, thus facilitating specialists' work. Nevertheless, we could not generalize this finding as it ought to be tested in future investigation on larger samples with equal number of men and woman who stutter.

## CONCLUSION

Based on the results obtained through the present study, several conclusions can be derived therefrom:

1. There are statistically significant differences in the frequency of male respondents who attend speech therapy because of stuttering compared to the frequency of women with the same diagnosis (male patients are twice as many);
2. The existence of a statistically significant difference concerning the birth weight between the respondents from the experimental and control groups is not established;
3. No statistically significant differences in basic personality dimensions between adults who stutter and the respondents from the control group are found;
4. No statistically significant differences are established in the personality structure between men and women attending speech treatments for stuttering.

The obtained results may only serve as a starting point for understanding the issue and for conducting further empirical research on the characteristics of the adult people with speech fluency disorders. This is especially true for birth weight being a risk factor for stuttering. In this respect, we need more complex research project and detailed anamnestic data that would indicate that low birth weight is factor resulting in neurological deficits relevant to speech fluency.

According to the descriptive indicators for the non-existence of statistically significant differences in the basic personality domains between the examined groups, speech therapy is attended by adult people who stutter, but who are, in their conative characteristics, comparable to persons from the typical population who do not stutter. They are not under risk that basic personality characteristics, acting as mediator, could make the rehabilitation-habilitation process more difficult, neither is necessary with regard to gender to make any differential approach to therapy. Therefore, treating the stuttering disorder in their case can be expected to have optimal effectiveness, especially the applied method (SSR) has proven itself in the existing practice of speech therapy as efficient, even for people with symptoms of psychopathological tendencies (Dobrota, Otašević, & Radević, 2018).



However, any more precise conclusion regarding the influence of gender, birth weight and basic personality dimensions on stuttering requires larger number of random chosen respondents and more sophisticated levels of data analysis. In this respect, it should be pointed out that the findings of the present study are limited by small and non-representative samples, and when it comes to personality domains, the findings are also limited by low reliability of the measuring instrument on subscale Openness (partly also Agreeableness), as well as the heterogeneity within the experimental group as to the stuttering degree and the time when a patient was subjected to the rehabilitation-habilitation treatment.

Further examinations of the personality structure for adult people with speech fluency disorders are needed not only to achieve correct selection and prediction of treatment outcome, but because of the stereotypes that contribute to exaggerating the personality dysfunctionality for such people, as well. The lack of valid, scientifically reliable documents, maintains these stereotypes persistent even among speech specialists.

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## WORKING WITH PUPILS WITH HEARING IMPAIRMENTS IN AN INCLUSIVE EDUCATION: CHARACTERISTICS AND COMPETENCES

*Original scientific paper*

**Saša Stepanović<sup>1</sup>**  
**Jelena Živković**

<sup>1</sup>*College of Social Work, Belgrade, Republic of Serbia*

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### ABSTRACT

*Hearing impairment, which belongs to the group of sensory impairments, represents a permanent lowered sensitivity to sound which can have a wide range of consequences on children's life. Complete and adequate inclusion of children with hearing impairments in the educational system requires a reconsideration of the traditional approach and a reorganization of the whole teaching process. The concept of an inclusive education requires providing support and the quality of education for every pupil, regardless of their impairments or disabilities, i.e. differences from the majority of pupils. For the purpose of movement towards these goals, this article discusses some important aspects of inclusion of pupils with hearing impairment by literature review, starting from their physical and psychological characteristics. The role of the teacher and the social environment is examined, and certain technical and pedagogical recommendations are made in working with these children.*

**Keywords:** *inclusion, pupils with hearing impairments, teacher's competences, guidelines*

<sup>1</sup> **Correspondence to:**

Saša Stepanović, College of Social Work, Republic of Serbia  
Terazije 34, Belgrade, Serbia  
E-mail: [salenono86@gmail.com](mailto:salenono86@gmail.com)

## INTRODUCTION

The idea of social justice and equality in access to educational opportunities is at the heart of inclusive education that started to reform traditional schooling since the second half of the XX century. In its implementation, the constant update of knowledge about all the components of the school system is necessary. This oversight of how things are being changed in contrast to status quo, enables faster and better coordination of the basic educational elements. Undergoing such a change means getting closer to the democratic ideal of society, in which every individual has a certain place and an active contribution. With changing segregated schooling, this ideal should ensure that every child, regardless of impairments has access to high-quality schooling (Stepanović, 2018). The existing spectrum of impairments people and children can have is very wide and each of them has its own peculiarities that represent a challenge for an adaptation of the modern educational trend. In the classroom, and as a part of the school community, a child with a hearing impairment is a different child, and the way other children understand and deal with the concept of difference is one of the tasks for inclusion (Florian, 2015; Stepanović, 2016). The perspective on difference is the first step toward the appreciation of the potential of uniqueness and therefore, the encouragement of active social involvement.

In modern literature of education, the understanding of difference is not based on the universal needs, common to all children. On the contrary, it is the individual differences and special rehabilitation needs that require the organization of specific conditions and acts. The complexity of the inclusive educational system goes far beyond the simple placement of these pupils in the class (Lutfiyya, VanWalleghem, 2013; Алехина, 2016; Салимова, 2016). It affects not only children with impairments, but also their peers, parents, teachers, etc.

The aim of this article is to provide a concise review of the literature on characteristics of pupils with hearing impairment and the properties of the environment

that surrounds them from early childhood. With an emphasis on the role of the teacher's competences in working with these pupils, this article gravitates toward general inclusive goals. Those goals implicate that the overcoming of obstacles is possible, as well as the realization of individuals' potential, by that very fact.

## PHYSICAL AND SOCIO-PSYCHOLOGICAL CHARACTERISTICS OF PUPILS WITH A HEARING IMPAIRMENT

Acoustic experience plays a key role in all cultures (Nierling et al., 2018). In senses rankings, hearing takes second place (San Roque et al., 2015, in Nierling et al., 2018). Thus, a hearing impairment is the most common sensory impairment – 5% of population, or 3 out of 1000 newborns (Ječmenica, 2016). A hearing impairment can be defined as partial or complete inability to hear (WHO, 2015) which can have different degrees, based on the state of the healthier ear (WHO, 2016): mild (26-40dB), moderate (41-60dB), severe (61-80dB) and profound, including deafness (81dB and more). It can be also classified by different criteria: innate/acquired prenatal/congenital/perinatal/postnatal; isolated/combined; prelingual/postlingual, progressive/nonprogressive (Ječmenica, 2016). The specificity of diagnosis gives a range of possible consequences that influence children with hearing impairment, but also their parents, school, and wider social environment.

Among many physical and psychological consequences of hearing impairment, problems in speech come first. The hearing impairment considerably limits the child's ability to speak, to develop literacy skills and language, which lead to lower verbal communication (Ječmenica, 2016; Малярчук и др., 2018; Пешкова, 2016). These children can often have poor vocabulary, bad pronunciation, agrammatic sentences, inconsistent with the narrative context, which reflects on both writing and reading (Moeller et al., 2007).

Since language and cognitive functions are tightly connected, impairment can have a negative influence on cognitive development in general (Jerković et al., 2010; Škrbić et al., 2013). and its specific aspects, such as unstable or shorter attention, limited abstract thinking, slower memory, strenuous understanding, lower visual perception (Lazor et al., 2008; Suzić, 2008; Škrbić et al., 2013) Intellectual development is also affected – nonverbal structures of intellect progressively develop while verbal structures poorly develop with delayed regulative function of speech in intellectual development (Škrbić et al., 2013; Щypова, 2016). This leads to the state that a child cannot fully follow narratives and participate in what is happening around him (Jerković et al., 2010).

Additionally, the aforementioned factors are usually accompanied with secondary, potentially more serious effects on personal and emotional development, and social integration (Ječmenica, 2016; Škrbić et al., 2013; Пешкова, 2016). The main problem of pupils with hearing impairment is the interaction with others as it takes great effort for them to comprehend the speech and the wider context. This leads to communication barriers and limited communicative activity, which cause other psychological problems: lower developed and less stable mental system, delayed general personal development, limited knowledge and activity, limited social experience and interpersonal relationships, strong need to communicate (Двуреченская, 2018, Малярчук и др., 2018; Пешкова, 2016). Limited interaction with social environment, especially the peers, can result in social isolation (Avramidis, 2010, Nierling et al., 2018; Салимова, 2016, Полешко, 2018). Along with the suffering difficulty of socialization and handling the school environment, it may seriously compromise the quality of life of an individual with a hearing impairment (Fellinger et al., 2008; Hintermair, 2011; Škrbić et al., 2013; Речицкая & Хедхуд, 2014). These factors primarily lie in the environment that does not recognize these difficulties or does not provide empathy, support and the opportunity for equal participation in various activities (Jerković et al., 2010; Mackenzie & Smith, 2009). Hearing is not

a visible impairment and can pass unnoticed by the environment, even specialists (Nierling et al., 2018). Indirectly, such an environment signifies insufficient readiness and organization of the system for the practice of inclusion, and it can leave deeper consequences (Vilotić, 2014; Stepanović, 2018). Often, pupils with a hearing impairment are stigmatized with prejudice and stereotypes, because the peculiarities of the impairment and its outcomes are hard for children without it to understand (Jerković et al., 2010; Данилова, 2017). In order to avoid intolerance and to fit in, these pupils tend to or to deny their impairment, which lead to them not seeking for help (Nierling et al., 2018). Despite the fact that this tendency has a protective purpose, it leads to a faulty understanding of the nature of impairment and negatively influences the identity of a pupil. The lack of understanding and social stigma towards these children (from peers, teachers and school in general), cause deformation in their personality: low self-esteem and self-respect, social-emotional immaturity, insufficient independence and responsibility, delayed moral development, low motivation, lack of interests, negative attitudes towards themselves and the people around them, rigidity and inability to adjust, helplessness, suggestibility, high anxiety and frustration, impulsiveness, demonstrative and aggressive behaviour in attention seeking, egocentrism and fixation on their own problems, behavioral problems, violation of norms, psychotic behavior (Jerković et al., 2010; Богданова, 2018; Малярчук и др., 2018; Пешкова, 2016).

Many authors agree that in the process of inclusive education, these negative outcomes of hearing impairment on a child should be diminished. Inclusive education, due to better integration and interaction of a child with hearing impairment with its peers, positively affects the development of interpersonal relationships, emotional well-being inside the class, increases communication skills, self-esteem and self-control and lowers psychological anxiety (Гильяно, 2018), but also develops personal qualities in pupils with normal hearing, such as readiness to help, tolerance, and empathy (Полешко, 2018).



Therefore, pupils with hearing impairments which are fully respected as equal by their school community can advance their communication skills, overcome physiological, psychological and social barriers, and hence, build a more positive image of their impairment and their identity as well. They become well socialized adults, deeply integrated into their community and culture, who achieved optimal level of life competences (Салимова, 2016). The established positive effects of a supporting environment indicate the necessity of investment in a system that hitherto, does not provide sufficient support.

## **THE GUIDELINES FOR WORKING WITH CHILDREN WITH A HEARING IMPAIRMENT**

There are numerous, research-supported suggestions for schools and teachers about the organization and standards for working with children with a hearing impairment. The application of every guideline first requires a good, thorough knowledge of the child's physical state (diagnosis). That effectively discriminates between needed adjustments, because the situation is very different with a completely deaf child (e.g. where a third party that provides the translation to the sign language is present) and with a partially deaf child.

Given that the class is currently mostly teacher-oriented (Stepanović, 2016), pupils with a hearing impairment should be seated as close to the teacher as possible, so that they can see them well. If the pupils' seating arrangement is circular, these pupils should be placed in the center. The most important thing is the orientation of the healthier ear to the source of sound (Ječmenica, 2016). The accessibility of sound depends on the classroom as well: the difference between "regular" classrooms and those adapted for children with hearing impairments is in good lighting and the appropriate acoustic properties (decreased ambient noise and echo) (Салимова, 2016). Visual aids that demonstrate the content (multimedia, pictures, objects, drawings, models) are highly encouraged. For the reason on their shorter attention span, potential

distractors should be eliminated, which is also tied to the question of classroom discipline.

The quality of the pupil's comprehension is largely conditioned by the characteristics of the speech he listens to. Teacher's speech should be of appropriate speed, clarity, diction and loudness, with moderate pauses and movements that accompany the content. Words that are too complicated are not advisable since they can confuse the child whose hearing impairment often comes together with a less developed vocabulary. If they are necessary or appear in the speech spontaneously, the teacher should check whether the child understood the meaning, and clarify it in case he didn't. On more demanding materials, additional clarification and repetition are very notable, as well as visual illustrations (Маслова, 2014). The teacher should be careful not to cover their mouth with hands while talking, because some pupils might be using lip reading. In some occasions the usage of a microphone is appropriate. Further, the teacher should not talk and write on the board simultaneously. That interrupts the flow of information and can affect understanding.

Other guidelines a teacher can follow is motivating a pupil with hearing impairment to be more active in class, to answer and ask questions. A teacher should develop skills to maintain attention of a pupil with hearing impairment but not letting him get too tired and unconcentrated (Маслова, 2014).

Considering these suggestions, it is also a teacher's task to teach other pupils how to talk with pupils with hearing impairment. It includes informing those pupils about hearing impairment features of their classmates and motivating them to interact in different activities during and after the class (Маслова, 2014). The healthy pupils have a role of helpers, bridge-builders between a teacher and a pupil with hearing impairment. Working with healthy pupils on developing positive attitudes and readiness to communicate with pupils with hearing impairments, represents an important element of inclusive teaching (Пешкова, 2016; Салимова, 2016). In the education of pupils with impairments, we should be oriented towards the optimal development of their personality and potential.

The key qualities of approach to children with hearing impairments are graduality, clarity, creativity, activity and patience (Lazor et al., 2008). The good guidelines and available instructions lower teachers' emotional tension and allow them to use resources for implementing different teaching methods in working with children with hearing impairment (Богданова, 2018; Маслова, 2014). Finally, consulting with the appropriate literature beyond the general guidelines, in the organization of class is advised in all situations because it narrows the teachers' attention only to the most relevant aspects of pedagogical practice.

## THE ROLE OF THE TEACHER

According to the strength with which inclusion influence the system of education, we can say that it represents multileveled, fundamental and systematic innovation. The contradictions that are present in traditional education are exacerbated in the inclusive education (Богданова, 2018; Салимова, 2016). Therefore, the implementation of inclusive education has many obstacles, general and specific, such as transformation of educational system, social prejudice and stereotypes in the community, lack of pedagogical and psychological support in inclusive education, lack of parental knowledge about the impairments, lack of teachers' competences in teaching in inclusive education (Маслова, 2014).

In many studies, professional and personal readiness of a teacher to work in inclusive education is seen as the main factor for its effectiveness, and the main principle of inclusive education. Authors usually define this readiness as „inclusive competence“:

- complex, multilevel personal structure, an attitude towards positive professional results, the possession and mobilization of special knowledge and skills in the realization of an inclusive education (Алехина, 2016; Яковлева, 2013);
- complex value and cognitive-psychological formation of a person, which allows a teacher to successfully educate children with impairments (Малярчук и др., 2018).

- a value aspect of a teacher – the formation of a basic personal culture of a teacher, professional relation towards children with impairments (Денисова, Рудакова, 2016).

- integral subjective characteristic of a teacher, based on a complex of academic, professional and socio-psychological competences, which provides work in the conditions of an inclusive education environment (Хитрюк, 2012)

- knowledge of specific features of pupils with impairment, methods and techniques of working with them in an inclusive education, and the formation of personal qualities that provide sustainable motivation for a teacher (Шумиловская, 2011)

- integrative personal formation, determining the ability to carry out professional functions in the process of inclusive learning, taking into account different educational needs of pupils and ensuring the inclusion of children with impairments into the environment educational institution, creating conditions for his development and self-development (Хафизулина, 2008)

Inclusive competence of a teacher includes different components. Hitryuk (2012) identifies two components: the first, motivational-conative component (the expression of social attitude towards all subjects of inclusive education), which determines the second – operational components (the formation of competences) (Хитрюк, 2012). Alehina's model consists of three components: cognitive readiness (teacher's knowledge about characteristics of the development of children with impairments; motivational readiness – the readiness to interact with those children, and personal readiness – the level of emotional acceptance of those children (Алехина, 2016). Hafizulina (2008) also identifies three components: the ability of a teacher to take into account the individual characteristics of pupils in the formation of individual educational path and to ensure its implementation; the ability to objectively assess the achievement of planned learning outcomes for pupils with impairments; the ability to correct methodology and organizational aspects of teaching.



Malyarchuk and colleagues (Малярчук и др., 2018) identify several components of teachers' competences:

- value-semantic (the teacher's understanding of the meaning of inclusion and positive attitude towards it, understanding the importance of teaching pupils with impairments about the values which are important for their personal resources);

- emotional-motivational (acceptance of pupils with impairments as equals, recognition of their rights, ability to see their positive qualities, motivation to help them to overcome difficulties in learning, bridging social distance and fighting discrimination);

- cognitive-psychological (knowledge of the specific patterns of abnormal development associated with primary, secondary and tertiary effects and barriers in teaching pupils with impairments; the ability to determine general and specific educational needs of these pupils and to activate their resources for self-development)

- operational-competence-base (the use of various kinds of information and network systems in the teaching process, the presence of positive self-identification of pupils with impairments; their inclusion in class activities)

- reflexive-strategic (teacher's objective self-assessment of his own preparedness and the acquisition of new competencies for teaching pupils with impairments, his disposition to adopt an inclusive worldview).

Therefore, a teacher that pragmatically and consistently follows the inclusive educational goals in working with pupils that have a hearing impairment understands the nature and characteristics of specific impairments and disabilities, provides diverse kinds of support to abilities of pupils who have them, and works on their social, developmental and educational progress through the careful organization of class. While doing that, teacher should follow five principles: 1) social acceptance and support, 2) early prevention and rehabilitation, 3) stimulation and compensation, 4) functional capacity development and 5) individuality (Suzić, 2008). Teachers should evaluate their practice by following the indicators of

these principles, like balancing the use of teaching methods and techniques, being certain that all pupils possess necessary materials for work and to know how to properly use them, providing all possible aids to pupils with hearing impairments, cooperating with other teachers and parents in order to adapt the class better and finally, being confident about his/her own competence.

Many studies showed that teachers are not ready (theoretically, practically and personally) to work with pupils with hearing impairment or other (Forlin, & Chambers, 2011; Jones, West, 2009; Lutfiyya, VanWalleghem, 2013; Stepanović, 20016; Tsakiridou, Polyzopoulou, 2014; Алехина, 2016; Данилова, 2017; Денисова, Рудакова, 2016; Кабушко, Слюсарева, 2017; Малярчук и др., 2018; Маслова, 2014; Сигал, 2014). The teachers consider themselves not competent enough; they have lack of professional knowledge about inclusive education, low motivation, and difficulties associated with social-psychological characteristics and personal attitudes (low level of professionally important personal qualities for them as specialists who act in conditions of inclusive education).

This kind of attitude can be a significant obstacle for the implementation of inclusive education, i.e. it can strengthen the traditional approach in which the teacher is the most active agent that attunes only to the "average" pupil (Stepanović, 2016). Appropriate teacher training and motivation maintenance are stressed in the literature as one of the most important factors in changing such opinions and improving professional competence. Therefore, the formation of readiness for professional activity in inclusive education should be a long-term strategy, which includes a set of measures aimed at developing necessary personal and professional qualities of a teacher and other subjects in inclusive education (Данилова, 2017; Кабушко Слюсарева, 2017; Логинова и др., 2017; Салимова, 2016, Сигал, 2014):

- development and implementation of retraining and advancing qualification programs for teachers, organizing internships, master classes, conferences

- development and implementation of psychological training programs that allow to build the ability to overcome barriers among teachers of inclusive education;
- provision of individual advisory assistance to the teachers who implement adaptive educational programs;
- development of teaching aids and recommendations for all subjects of educational environment (teachers, parents, administration), based on the contemporary research in all relevant field of pedagogy.

It is highly important to shift the focus from informing about inclusive education to the practice-oriented nature of training - mastering specific skills to carry out an inclusive educational process, because the most teachers stress out problems of implementing a teaching process and difficulties in ensuring its effectiveness (Логина и др., 2017).

## CONCLUSION

The global trend of inclusive education is one of the most important paradigm shifts in the last couple of decades that revitalized democratic ideas and placed their value as central. The social and educational inclusion of those who are marginalized contributes to the society as a whole. It enables the realization of individual potentials that everyone, regardless of the nature or degree of disabilities, possesses. In work with children who have a hearing impairment, the goal is not only their school success, but also the acquisition of communication skills that represents the irreplaceable element of a functional knowledge. Those skills include the speech itself as well as the communication norms. Having in mind the characteristics of these pupils, their vulnerability in terms of possible primary and secondary consequences, and the findings of numerous studies that emphasized environmental factors moderating these consequences, it is crucial to integrate current knowledge through the structural change of the teaching process. Providing the social network of support consisting of important figures in childrens

life (parents, teachers, peers), adapting technical conditions of the classroom and nurturing a tolerant, patient social atmosphere can not only ease the pupil's engagement, but prevent many interpersonal and intrapersonal problems. In this process, the teacher has the key role, as he is the one who conducts the principles of inclusion, optimizing the learning and developmental processes in every pupil. For this reason, great efforts need to be invested into pushing the institutional, physical and psychosocial barriers of segregated schooling, so that the implementation of inclusion in real life can be possible.

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## LONELINESS OF HIGH SCHOOL AND COLLEGE STUDENTS: THE RELATION OF SOCIO-DEMOGRAPHIC CHARACTERISTICS AND SELF-ESTEEM WITH LONELINESS

*Original scientific paper*

**Nataša Kostić<sup>1</sup>**  
**Šuajb Solaković**

<sup>1</sup>*Psychology Department, Faculty of Philosophy, University of East Sarajevo, Bosnia and Herzegovina*

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### ABSTRACT

*The research problem relates to the examination of the relation of socio-demographic characteristics (gender, level of education and the place where most of childhood was spent) and the self-esteem of the respondents with loneliness. In investigating this problem, the focus was primarily on the perception of the distribution of loneliness, and the examination of the relation of independent variables (socio-demographic characteristics and self-esteem) with the dependent variable (loneliness). The sample of respondents consists of 677 high school students (49.34%) and college students (50.66%) of Bosnia and Herzegovina. The range of years of subjects ranges from 15 to 23 ( $AS = 18.696$ ). The results of the study show that there is a statistically significant difference in loneliness with regard to gender ( $U = 38672.000$ ,  $Z = -6.122$ ,  $p = .000$ ), to the level of education ( $U = 42292.500$ ,  $Z = -5.905$ ,  $p = .000$ ) and the place in which the respondents spent most of their childhood ( $\chi^2 = 9.383$ ,  $df = 2$ ,  $sig = .009$ ). The results show that there is a statistically significant relation between self-esteem and loneliness ( $r_o = -.401$ ,  $sig = .000$ ,  $N = 676$ ).*

**Keywords:** *Loneliness, self-esteem, socio-demographic characteristics, high school, students*

<sup>1</sup> **Correspondence to:**

Nataša Kostić Psychology Department, Faculty of Philosophy, University of East Sarajevo, Bosnia and Herzegovina  
Pale, Republic of Srpska, Bosnia and Herzegovina  
E-mail: [natasa.kostic@ffuis.edu.ba](mailto:natasa.kostic@ffuis.edu.ba),



## INTRODUCTION

The human is a social being and, as such, strives to enter into different social contacts, associates with others and creates close and intimate relationships with them. The social contacts it strives are both quantitative and qualitative in nature. The feeling that he lacks quantity or quality, or both aspects of social relations is perceived by the individual as loneliness. An individual can have a large number of social relationships and feel alone, but also lead a rather lonely life, but not feel lonely. De Jong Gierveld, Van Tilburg, Dykstra (2006) state that the conceptualization of loneliness began in the late 1950s, and that empirical research was spurred by the work of Perlman and Pepla (1981), which defined it as an unpleasant experience that happens when a network of social relationships of an individual is defective in some important way, whether quantitative or qualitative. The standard for optimal quantity and quality of social relationships does not exist. It is subjectively determined and represents the desired relationships of the individual. Precisely because of the subjective feeling of a lack of satisfactory social relationships, the individual begins to experience loneliness. Hombrados-Mendieta, García-Martín, Gómez-Jacinto (2012) consider that it reflects the interpersonal deficit that arises as a result of fewer or less satisfactory relationships than an individual wants. Asher and Paquette (2003, according to Akin, 2010) define loneliness as a cognitive awareness of the lack of social and personal relationships, accompanied by affective reactions of sorrow, emptiness and longing. The definition points two aspects of loneliness, which are both cognition and emotion. It is obvious that loneliness results from a cognitive assessment of individual relationships, which are followed by emotions in relation to those assessments. By defining loneliness as a situation experienced by an individual in relation to an unpleasant or unacceptable deficiency (quality) of certain relationships, De Jong Gierveld (1998) points out that it includes three components: 1) feelings about absence of intimate attachment,

feeling of emptiness or abandonment, 2 ) a time perspective (people interpret their loneliness situation as hopeless or as changeable and curable, blame others or themselves for the situation in which they are), 3) the comprehension of different types of emotional aspects, such as sadness, regret, shame, guilt, frustration and desperate. Approaches to loneliness are different, so it is possible to distinguish several types and sorts of loneliness. There are differences in the perception of loneliness as a one-dimensional or multidimensional construct. According to the multidimensional understanding there are different types of loneliness. Weiss (1987, according to Hombrados-Mendieta, García-Martín, Gómez-Jacinto, 2012) distinguishes two types of loneliness, which are: emotional and social. Emotional loneliness is perceived as a lack of attachment in relations and is associated with a feeling of emptiness and the desire to share life with a particular one. Social loneliness arises from the lack of a social network (friends, colleagues, neighbors) and leads to feelings of being rejected by others. This division suggests that the first type refers to the lack of quality, and the second is the lack of the quantity of social relations. Garson and Perlman (1979, according to Javeed, 2011) distinguish chronic and temporal loneliness. Both types present a subjective state of emotional discomfort due to the lack of social and emotional relationships, with the first being a more permanent state, while the second occurs occasionally as a result of life-changing or situations that hinder the social life of an individual in a shorter period of time. Loneliness is common both for children and adults. Some data show that 80% under the age of 18, 40% over 65, declare that at times they feel lonely (Weeks, 1994; Pinquart, Sorensen, 2001; Berguno, Leroux, McAinsh, Shaikh, 2004, according to Hawkey, Cacioppo, 2010 ). Mahon, Yarcheski, Yarcheski, Cannella, Hanks (2006, according to Lasgaard, Elklit, 2009) point out that the results of the study show that loneliness increases during adolescence, while Heinrich, Gullone (2006, according to Lasgaard, Elklit, 2009) state that during this period it is most widespread.



The loneliness of adolescents can be normative due to significant changes in social expectations and needs, and thus represents a natural part of life and is to some extent considered positive, ie, the source of personal development (Lesgaard, Elklit, 2009). Adolescents face various events such as changes, school obligations and obligations during studies, future planning, economic difficulties, family relationships (Woodward, Kalyan-Masih, 1990; Byrne, Devenport, Mazanov, 2007; Moon, Rao, 2010; Thorsteinsson, Ryan, Sveinbjornsdottir, 2013) that contribute to loneliness. During this period, they search for their own identity, and contacts and closeness with peers are important for their proper functioning. Coping with all of these can contribute to the feeling of a lack of quantity and quality of social relationships, that is, to experiencing loneliness. Nekić, Uzelac, Jurkin (2016) state that on the basis of the research it is possible to distinguish five factors that contribute to the appearance of loneliness in adolescence, which are: 1) physical changes, 2) cognitive changes, 3) changes in social relations, 4) establishment of autonomy and individuation; and 5) the development of identity. Berk (2008) considers that in the period of adolescence the development of abstract thinking enables the imagination of possible and ideal as well as perfect social relationships, which contributes to increased sensitivity to the quantity and quality of current relationships. When it comes to differences in loneliness with regard to the gender, they did not give unambiguous results, but some authors (Lacković-Grgin, Penezić, Sorić, 1998) suggest that more research suggests that men are more lonely than women. Researchers from different authors have shown that men are more lonely than women (Lacković-Grgin, Penezić, Sorić, 1998; Koc, 2012). On the other hand, some studies have found that women are more lonely than men (Victor, Yang, 2012; Javeed, 2011; Baran, Baran, Maskan, 2015;), while Neto (2014), as well as Nekić, Uzelac, Jurkin (2017) did not find differences in loneliness with respect to the gender of the respondents. Stickley et al. (2016) in their researches carried out on a sample

of respondents from a year span of 13 to 15 years in the United States, Russia and the Czech Republic have found that loneliness is to a greater extent characterized by adolescent women than adolescent men. For a higher level of loneliness in men than women, authors point out that they are less likely to expect social relationships and are less fortunate in them (Claes, 1992, according to Medved, Keresteš, 2011), and because of that, they feel lonely, while others, as a reason, state their poor ability to express feelings (Wiesman, Guttfreund, 1995, according to Medved, Keresteš, 2011). Authors explain higher levels of loneliness of the female gender than male as that because they value interpersonal relationships more (Al Khatib, 2012; Anderson et al., 1983; Yaacob et al., 2009, according to Nekić, Uzelac, Jurkin, 2017). The results of the research are also not unambiguous when it comes to differences in the loneliness of younger and older adolescents. Baran, Baran, Maskan (2015) did not find differences in loneliness among adolescents of different grades, as well as of age, in their research. On the other hand, some studies have shown that younger adolescents are lonelier than older adolescents (Mahon, 1983; Mijušković, 1986; Nekić, Uzelac, Jurkin, 2016), while others have shown that older adolescents are lonelier than younger ones (Brage, Meredith, 1993; Chipuer, Pretty, 2000). When it comes to the relation between the quantity of social relations and loneliness, it can be concluded that the quality of social relations rather than quantity significantly influences loneliness. On the basis of the results of several studies, Jackson, Soderlind, Weiss (2000) cite several aspects of social relationships that are important determinants of loneliness: satisfaction with their own social networks, the experience of closeness and intimacy in interpersonal relationships, the knowledge that they can count on the support of people from their own social networks and their involvement in a social network whose members are highly interconnected. In addition to the socio-demographic characteristics in the study of loneliness, its relationship with self-esteem was seen.

Mead (1934, according to Milošević, Ševkušić, 2005), as one of the first authors who give a definition of self-esteem, considers that it is the way in which an individual values himself and that it is the result of an individual's interaction with significant others. Coopersmith (1967, according to Heatherton, Vox (2000) defines self-esteem as an individual's evaluation of himself that expresses the attitude of approval, ie to what extent does he/she believe that he/she is capable, significant, valuable, and successful. Rosenberg (1968, 1979; Simons, 1987) views self-esteem as a general negative or positive attitude towards oneself. Vanhalst, Luyckx, Scholte, Engels, Goosens (2013) state that low self-esteem follows the current, but also later, feeling of loneliness in adolescence. These longitudinal studies have determined that there is a significant connection between self-esteem and loneliness. Baran, Baran, Maskan (2015), as well as Nekić, Uzelac, Jurkin (2016) have established a negative correlation between self-esteem and loneliness. Earlier researches (Rubin, Mills, 1991, Cash, 1995) pointed low self-esteem as a significant factor of loneliness. Stickley et al. (2016) point out that adolescents often feel lonely and that low self-esteem is associated with it. Tucak Junaković, Nekić, Burić (2013) point out that a number of studies show that loneliness leads to psychosomatic problems and mental health disorders. Given that the development of self-esteem is determined by environmental factors and that its development can be influenced. Examination of the relationship between self-esteem and loneliness would allow us to look at those factors that would potentially contribute to the negative effects of loneliness. In an exploratory sense, it would be necessary to take into account the socio-demographic characteristics of the respondents when considering self-esteem. It is possible that such research would allow us to examine the impact of certain variables on loneliness.

## PROBLEM AND TASKS OF RESEARCH

Given that loneliness can lead to certain disorders (Tucak Junaković, Nekić, Burić 2013) and therefore adequate functioning of individuals, we can say that research on loneliness is a social problem that should be taken more seriously. The research problem relates to the examination of the relation of socio-demographic characteristics (gender, level of education and the place where most of childhood was spent) and the self-esteem of the respondents with loneliness. In investigating this problem, the focus was primarily on the perception of the distribution of loneliness, and the examination of the relation between self-esteem and loneliness, and the difference in manifestation of loneliness with respect to the sociodemographic characteristics of the respondents. of independent variables, socio-demographic characteristics and self-esteem) with the dependent variable (loneliness). In accordance with the above, the following research tasks were set up:

- 1) examine and analyze the distribution of loneliness,
- 2) examine and analyze the differences of the respondents in loneliness with regard to their socio-demographic characteristics (gender, level of education and the place where most of childhood was spent),
- 3) examine and analyze the relationship of self-esteem and loneliness of the respondents.

## METHODS

Data collection was performed in the 2017-2018 academic year, respectively. The sample consists of 677 students of high school and college students of Bosnia and Herzegovina (58.94% of respondents from Republika Srpska and 41.06% from Federation of Bosnia and Herzegovina). The sample is consistent with whether the respondents attend high school or are college students. In this study we use convenience sampling, Data were collected in schools and colleges where research was possible. The age of subjects ranges from 15 to 23 (AS = 18.696). Self-assessment of respondents was used to determine where most of childhood was spent. The sample structure is shown in Table 1.

Table 1 Structure of sample of respondents

Specimen of the sample		Frequency	Percentage
Gender	Female	423	62.48
	Male	254	37.52
Level of education	High school student	334	49.34
	College student	343	50.66
Grade	First	50	14.97
	Second	107	32.04
	Third	111	33.23
	Fourth	66	19.76
Year of study	First	113	32.94
	Second	120	34.99
	Third	54	15.74
	Fourth	56	16.33
The place where most of childhood was spent	Countryside	209	31.38
	Minor settlement	172	25.83
	City	285	42.79

## Research instruments

The research used the following instruments:

Questionnaire for collecting data on the socio-demographic characteristics of the respondents (age, gender, level of education, the place where the most of childhood was spent), The Rosenberg self-esteem scale was used to examine self-esteem (RSS) (Rosenberg, 1965). The scale contains 10 statements, of which 5 are positively worded and 5 are negatively worded. In order to calculate the total score of the respondents on the scale for negative claims, the inverted values of the answer are so that the higher score achieved indicates a higher level of self-esteem. An example of a positively worded statement is, "I think I'm worth at least as much as other people," and the negative is, "I feel I don't have much to be proud of." The values of the answers to the question, "How much do the following statements apply to you?" That respondents could choose

for each statement on the scale are the following: 1 - does not apply to me at all, 2 - generally does not apply to me. 3 - neither relates to nor applies to me, 4 - mainly applies to me, 5 - fully applies to me. Higher scores on the scale indicate more self-esteem.

An adapted version of the short UCLA Loneliness Scale, constructed by Allen and Oshagan, was used to test loneliness (1995, prema Lacković-Grgin, Penezić, Nekić, 2002). The adaptation of the Croatian-speaking scale was performed by Lacković-Grgin, Penezić, Nekić (2002). The scale contains seven statements, some of which are: "I have not been close to anyone for a long time" and "People are around me, but not with me." Respondents were able to answer the statements as follows regarding their own experience of self: 1 - does not apply to me at all, 2 - does not apply to me mainly, 3 - neither relates nor relates to me, 4 - mostly applies to me, 5 - totally applies to me.

All claims are formulated so that achieving a higher score indicates a higher expression of loneliness, which means that a higher score on the scale indicates a higher loneliness expression. The instruments were adapted to the respondent's speech area.

## RESULTS OF RESEARCH

An analysis of the results related to the distribution of loneliness found that it statistically deviates significantly from the normal distribution. The values of Kolmogorov-Smirnov test indicated on this (sig<.01).

*Table 2 The values of the Kolmogorov-Smirnov test for analyzing the normal distribution of respondents response on the loneliness scale*

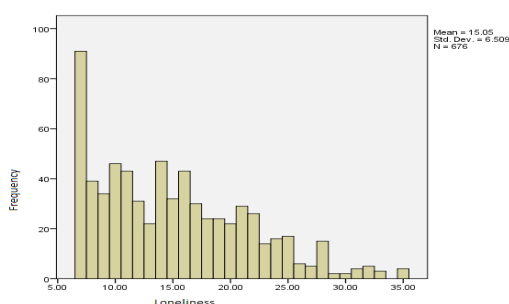
St	df	sig
.093	676	.000

A further analysis revealed that respondents to a greater extent are characterized by a lower level of loneliness.

*Table 3 Measures of central tendency and variability of responses of respondents on the loneliness scale*

AM	Md	St. dev	Min	Max	R	Sk	Ku
15.050	14.000	6.509	7.00	35.00	28.00	.686	-.170

The positive sign of the skewness (.686) indicates a grouping of data around lower values, that is, a more frequent manifestation of a lower level of loneliness of the respondents. The aforementioned can be noticed on the graphic representation of the distribution of the loneliness of the respondents (Chart 1).



*Chart 1. Distribution of loneliness*

Using the Mann-Whitney U test, the differences between female and male respondents in loneliness were examined (Table 4).

*Table 4 Differences in loneliness of female and male respondents*

Gender	N	Md
Female	423	13.000
Male	254	16.000

U = 38672.000      Z = -6.122      sig = .000

Based on the results shown in Table 4, it can be concluded that male respondents are statistically significant (U = 38672.000, Z = -6.122, p = .000) characterized to a greater extent by loneliness (Md = 16.000) than female respondents (13.000).

Furthermore, using the Mann-Whitney U test, the differences between high school and college students in loneliness were examined (Table 5).

*Table 5 Differences in the loneliness of high school students and college students*

Level of Education	N	Md
High School Student	334	16.000
College Student	343	13.000

U = 42292.500      Z = -5.905      sig = .000

The results shown in Table 5 show that there is a statistically significant difference in the loneliness of high school students and college students (U = 42292.500, Z = -5.905, p = .000). High school students are more likely to be lonely (Md = 16,000) than college students (13,000).

The use of the Kruskal-Wallis test examined differences in loneliness among the respondents who spent most of their childhood on countryside, in a minor settlement and in a city (Table 6).

Table 6 Differences in loneliness with regard to where the respondents spent most of their childhood

The place where most of childhood was spent	N	Md
Countryside	209	15.000
Minor Settlement	172	15.000
City	285	13.000
$\chi^2 = 9.383$ $df = 2$ $sig = .009$		

The obtained results show that there is a statistically significant difference in loneliness with regard to the place where the respondents spent most of their childhood ( $\chi^2 = 9.383, df = 2, sig = .009$ ). Respondents who spent most of their childhood in the city are characterized by a lower level of loneliness ( $Md = 13,000$ ) than respondents who spent most of their childhood on the countryside and in a minor settlement ( $Md = 15,000$ ).

Based on Spearman's correlation coefficient, it has been stated that there is a statistically significant relationship of medium intensity between self-esteem and loneliness ( $r_o = -.401, sig = .000, N = 676$ ).

Table 7 The corelation of self-esteem and loneliness

$r_o$	sig	N
-.401	.000	676

The negative sign of correlation ( $r_o = -.401$ ) indicates that a higher expression of one psychological characteristic of the subjects entails a lower expression of another psychological characteristic. Since higher scores on the scales used indicate higher levels of expression and self-esteem and loneliness, a negative sign of correlation indicates that respondents with higher self-esteem are less characterized by loneliness.

## DISCUSSION

Based on the results shown, it can be concluded that the socio-demographic characteristics of the respondents, and the attitude towards oneself, ie self-esteem, are important to explore loneliness. Loneliness refers to the experience of quantity or quality of social relationships. Humans are social beings and as such they strive for social contacts, as well for association with other people, which implies close and intimate relationships with them. The individual lives today in a time of accelerated development and intensive use of technology which, on the one hand, enables a large number of social contacts, and on the other hand disables the quality of those contacts. In addition to the accelerated development of technology, there are changes in the organization of society on a global level, and consequently changes in value systems. The question is whether loneliness is solely determined or there are other factors contributing to loneliness. The obtained results indicate that the problem of loneliness can be explained by a series of psychological aspects that fall within the domain of socialization and personality. An analysis of the distribution of loneliness found that high school students and college students have a lower level of loneliness to a greater extent. Since the survey did not cover younger and older respondents, the results obtained can not be compared with the results of the research, which determined the increase in loneliness in the adolescent period compared to other developmental periods. On the other hand, it is possible to look at the results of the research in the context of social contacts characteristic of the adolescent period. The authors emphasize the various life events that can contribute to loneliness in the period of adolescence, and that this period of development is both physically and psychologically. In this period, there is an abstract thinking that gives the individual new perspectives of thinking and concluding. He can perceive the current state and ideas of the future, but also strive for the more ideal one. It is also the period of identity development.



Each of these factors can contribute to loneliness, but on the other hand, each one can stimulate a search for new and better-quality social contacts in which the adolescent will try to find answers to various questions. In contact with their peers, they will find similar interests, similar problems, and the expected answers, and will therefore be more satisfied with their own social contacts, and to a lesser extent experience loneliness. On the other hand, it is possible, in this period, that they express their needs and interests more clearly and more actively in front of adults, which enables them to better understand them, and therefore the adolescent perceives interpersonal relationships with them as qualitative, which reduces the possibility of a feeling of loneliness. The results of the study showed that male respondents statistically significantly to a greater extent are characterized by loneliness than female respondents. The obtained results are in accordance with the findings of individual authors (Lacković-Grgin, Penezić, Sorić, 1998; Koc, 2012). The results obtained can be explained by the interpretations of other authors who consider that men are characterized by lower expectations of social relationships and are less invested in them and less realized in them, and to a greater degree feel lonely (Claes, 1992, according to Medved, Keresteš, 2011). It is also possible to seek explanation in the processes of socialization that traditionally direct the children of the male and female gender to invest in various aspects of life. Traditionally, female children are more focused on activities that involve long-term care for others, while male to activities that imply strength and skill. By rewarding certain patterns of behavior, children make them to a greater extent, and develop skills that are important for their realization. Girls are to a greater extent directed towards the realization of close interpersonal relationships, and therefore they invest more in them, and consequently they achieve them in an adequate way, and for this reason they are to a lesser degree characterized by loneliness. Boys rely heavily on skills and strength, and do not underline activities that involve more open communication in terms of recognizing their own weaknesses and fears, and are partly limited in achieving interpersonal relationships that would satisfy them.

Based on the established results of the research, it can be concluded that high school students are characterized by loneliness more than college students. This result is consistent with the results of the research carried out by some other authors (Mahon, 1983; Mijušković, 1986; Nekić, Uzelac, Jurkin, 2016). The results obtained can be explained by the fact that college students have partly already had an idea of what to do in the future, while in front of a large number of high school students there is a choice of a lifelong call. Also, college students are at the end of adolescence, i.e. developmental problems characteristic of adolescence are largely behind them. Also, changes in physical development are in this period of less intensity than in high school students. The results of the survey show that the respondents who spend most of their childhood in the city experience less loneliness than the respondents who spent most of their childhood on a countryside or in a minor settlement. Based on the results of several studies, Jackson, Soderlind, Weiss (2000) cite several aspects of the quality of social relationships that contribute to a lesser sense of loneliness, and its conclusions are based on research that has determined that the quality of social relationships affects to a greater extent loneliness than quantity. Given the established differences between the respondents who have spent childhood in places that are more populated and those who have spent it in a less populated place, it can be assumed that the quality of interpersonal relationships depends on the quantity. Namely, in more populated places, the possibility of choosing social contacts is higher, as well as the possibility of searching for social contacts that will correspond to the individual to a greater extent. By analyzing the obtained results it was found that self-esteem statistically significantly correlates with loneliness. A positive attitude about oneself, evaluating oneself as a capable, significant, successful and valuable one is one of the aspects that enable an individual to enter into social relations more easily and search for the positive aspects of those relationships, and therefore feel a lower level of loneliness. On the other hand, this relationship can be reciprocal. Due to the fact that he does not realize the quantity and quality of social relationships that a person desires, he may consider himself less valuable and less capable than other people.

## CONCLUSIONS

In the conducted research, it was established that the distribution of loneliness among high school students and college students statistically varies significantly from normal distribution, in the direction of manifesting lower values of loneliness. The differences in loneliness are determined by gender, level of education and the place where most of childhood was spent. Male respondents are characterized by a higher level of loneliness than female respondents, high school students are characterized by higher level of loneliness than college students, and respondents who spend most of their childhood on a countryside and in a minor settlement are more lonely than respondents who spent most of their childhood in the city. Between the self-esteem and loneliness of the respondents, a statistically significant connection of the negative sign was established. In further research, for the purpose of improving knowledge about the problem, it would be desirable to include some other factors that could explain the obtained results (eg, the relationship of parents to male and female respondents, emotional closeness with parents, relationships with peers, etc.).

## DECLARATION OF CONFLICTING INTERESTS

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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## ROLE OF ADDITIONAL ACTIVITIES AND COMPETITION IN THE TEACHING OF MATHEMATICS

*Original scientific paper*

**Maid Omerović<sup>a</sup>**

**Sead Rešić<sup>b</sup>**

**Ahmed Palić<sup>a</sup>**

**Tarik Bazdalić<sup>a</sup>**

<sup>a</sup>*Faculty of Education, University of Travnik, Bosnia and Herzegovina*

<sup>b</sup>*Department of mathematics, Faculty of Science, University of Tuzla, Bosnia and Herzegovina*

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### ABSTRACT

*The development of science is essential when it comes to the development of society, while the mathematics necessary for the development of science. The fact that the children are all clearer, more capable and versatile, and their mathematical knowledge smaller and worse, motivated me to this research. How would our society be better you need to choose talented and creative young people who will represent the same company. One way of selecting children, and choosing the best are just competitions. In this work, attention will be focused on additional classes and competitions of teaching mathematics, as well as their importance in the education and development of children in schools. When it comes to gifted students, one of the main events where they can demonstrate their knowledge and skills are the competition. The overall objective of this research is to determine the extent to which the additional classes represented in schools and how many students go to additional classes and competitions in mathematics. The study included 103 primary school students in the municipality of Ilijaš. The results obtained in this study mostly on the representation of additional teaching of mathematics in schools or with, a small number of students. Because the necessary mathematical talent, the will and desire to learn mathematics. Viewed from the perspective that the disciples mathematics not so favorite subject, these are the expected results.*

**Keywords:** *extra classes, mathematics competition, student, teacher.*

<sup>1</sup> **Correspondence to:**

Maid Omerović, Faculty of Education, University of Travnik, Bosnia and Herzegovina  
E-mail: [maid.omerovic@gmail.com](mailto:maid.omerovic@gmail.com)

## INTRODUCTION

The gifted students and the teaching of them have always been of particular interest to anyone who has had an education. Gifted students in mathematics teaching is a topic that every teacher or professor of mathematics should devote to. According to the rulebook on elementary education of gifted students, giftedness is a set of traits that enable a student to achieve above-average results in one or more areas of human activity, and is conditioned by a high level of development of individual abilities, personal motivation and external encouragement. Accordingly, each mathematics teacher should specifically devote himself to such students and assist them in their continued growth and development, taking into account their personal interests, abilities, specific needs and potentials, going beyond the intended curriculum. Although gifted students have a higher level of intelligence than their peers, they can partially make up for most of their education deficiencies, often disadvantaged in the sense that they may or may not be able to reach their full potential, which can then lead to frustration, loss of self-esteem and serious difficulties in their continued progress. "The most that education can provide a child in his or her development is to help him and guide him to the area in which his talents are most appropriate, where he will be satisfied and professional." (by Daniel Jay Goleman)<sup>2</sup>

The additional teaching aims at enabling students who love mathematics and successfully acquire mathematical content in regular teaching to advance, deepen and expand those contents, and thus to stimulate even stronger motives for learning mathematics. (Vušović Lj., 76.)

Additional teaching of students motivates to creative work, independent work, develops the ability of logical thinking among students, develops creative and critical thinking, equips the student for self-education with the help of literature.

In general, additional teaching enables gifted students

to express and develop their mathematical skills. In addition to its extremely general educational function (providing students with the opportunity to acquire additional and deeper knowledge and skills), it also has a significant educational function (positively and strongly influences the intellectual, work, aesthetic and moral education of students - the positive qualities of students' personalities necessary for his actions in society). Every teacher-teacher in primary and secondary school needs to know the methodological criteria when recognizing students for additional teaching in mathematics.

That is why it is necessary that this ability for mathematics is noticed in the students at the right time and in the right way. The student should be recognized on the basis of his particular ability and aptitude for mathematics, especially his ability to think logically, then his reasoning at an elevated level of abstraction, then his quick generalization, and his ability to cope independently in problem situations; as well as the originality of solutions to problems and the posing of new problems (resilience and creativity of thinking), critical thinking and the like. Mathematics students' ability is correlated with various other intellectual abilities as well as personality traits, such as increased interest in mathematics, tendency towards clarity, precision, precision, criticality, perseverance, curiosity.

Mathematical abilities and aptitudes begin to be manifested partly in the older grades of primary school, and whether and to what extent they will be further developed depends on the conditions of life and learning, and especially on the impact through continuing mathematics, during further education. When it comes to gifted students we cannot overlook the topic of "competitions", since competitions, at least in our country, are a rare opportunity for students to test their knowledge and abilities, which go beyond the standard school curriculum. It is a challenge where they can measure their strengths with students outside the classroom in a material that goes beyond what is foreseen in the standard curriculum and gain a more realistic picture of their knowledge and abilities. In addition, some awards in upper elementary school grades may allow them to enroll in their preferred high school more easily because of the points they earn.

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<sup>2</sup> 20 inspirirajucih citata o nastavnicima, <https://skolski.ba/20-inspirirajucih-citata-o-nastavnicima/54934/>, 31.3.2020.



The situation is different for teachers. There are no mechanisms in place to stimulate teachers to prepare students for the competition. There is also no legal obligation to do this, and teachers themselves, if we exclude the enthusiasm of few individuals, have no interest in competitions. There is an obligation to hold additional classes, but it is not known what their number should be when these classes are held (not scheduled), and the space in which they would be held in our overcrowded schools is a major problem. All these reasons provide a great excuse not to hold the preparation hours for the competition in the form of extra classes (except by a small number of enthusiasts). However, it is very important to emphasize that some schools are already changing this practice. This is another of the many indications of concern for gifted students that accompanies them during their schooling with us. In the past, the notion of giftedness has been associated solely with high intelligence ratios. (Vajagić Z., 3.)

It was based on the assumption that gifted students are born with a high level of intelligence and can be recognized by their high grades and final exam scores, and are able to excel in all fields, both in education and in life in general. The fact that students are different may be inappropriate but inevitable. Adaptation to diversity is a necessary price for productivity, high standards and an equal attitude towards all students

*“... the school will always be as good or bad as its teachers or their good ones. Goodwill alone is not enough. She needs a complement of professional competencies.” (Bach)*

*“We are not all equal, we do not all have the same minds, education works most effectively when these differences are taken into account, not when they are denied and ignored.”*

## **The responsibility of the school and teachers in the development of mathematically gifted students**

The teacher plays a big role in discovering gifted students. Students gifted with mathematics need not be successful in other subjects, so it is not easy to identify them. It is important for the teacher to learn to recognize the needs of gifted students and their characteristics. Also, teachers who have a good relationship with their students are able to use that knowledge as a good guide to working with them, rather than separate the gifted students according to traditional tests. Teachers need special training and support in recognizing mathematical talent. Teachers working with gifted students should have a good knowledge of mathematical content, but if the school has only a few gifted students and does not have a suitable teacher, they should be allowed to work with a suitable mentor outside their home school. The harmonized program must be so arranged that the mathematical knowledge acquired in one school year is not repeated or interrupted in another. (Elezović N., 45.)

The school should have an organized support system that includes the provision of appropriate books, technology and staff for trained people. When full-time and extensive experiences with gifted students are provided in full-time teaching, the potential for enriching the educational community is created. Namely, other students in these conditions develop increased interest and with a little help can master more demanding tasks. Therefore, all students have the opportunity to learn according to their abilities if they are offered a variety of assignments and teaching materials while teaching, following the rhythm of their learning and monitoring their needs. (Vejagić Z., 32.)

## METHODS

### Procedures

The basic procedures in this research are:

- prior to the research, preparations were made in the form of research and analysis of various scientific papers on the subject of additional teaching / competition.
- In accordance with the topic of this transversal research, the survey was done using a 10-item item scale on the importance and role of additional teaching and competition in mathematics teaching, and Ilijaš students were interviewed;
- cooperation with the mathematics teachers of this elementary school was made, explaining the importance of conducting this research and agreeing to conduct it with the students during the class.
- after brief instruction, four grades of elementary school students, a total of 103 students were required to respond to ten thematic statements by selecting one of the response options offered
- the students voluntarily participated in the examination, were aware of the fact that the survey was anonymous, they were able to ask questions in case of ambiguity, as well as information that the data would be used solely for scientific purposes and that accuracy and answering of all questions asked were important for research, so we asked them to collaborate.

### Sample research

The sample of this research consists of students of VI, VII, VIII and IX grades. The sample includes 103 students, 30 male and 73 female. A total of 25 6th grade students, 27 7th grade students, 28 8th grade students and 23 9th grade students out of which 9 students once participated in any of the competitions

## Research instrument

The reliability of the survey instrument was verified by the well-known Cronbach Alpha coefficient, which for 14 points is 0.816, which represents a good internal consistency and indicates that it is a reliable measuring instrument.

In order to examine students' attitudes towards additional teaching and mathematics competitions, a student survey questionnaire was used, which included 10 alternative-type questions. The questionnaire provided ratings (1 to 5) for their evaluation. We will analyze and compare students by considering grades 5 and 4 to be more or less in agreement with students, while 2 and 1 will be more or less in agreement. If a student has rated a claim with a grade of 3, we will consider that he or she is hesitant to make that claim.

In the questionnaires, students were asked to write a grade in mathematics, a school achievement at the end of the year, as far as going to additional classes. The questions in the instrument relate to students' attitudes toward additional teaching in the teaching process, what is the teacher's interest in maintaining an additional section, does the student burden additional teaching, do they neglect other subjects because of additional teaching, do competitions only include mathematically gifted students?

### Statistical analysis

After the data collection method, the statistical program SPSS 19.0.1 was applied for the data processing method and interpretation of the obtained results. From statistical procedures we calculated frequencies, sum, arithmetic mean, standard deviation, standard error of arithmetic mean, as well as one-factor analysis of variance ANOVA, bivariate correlation analysis.

## RESEARCH RESULTS

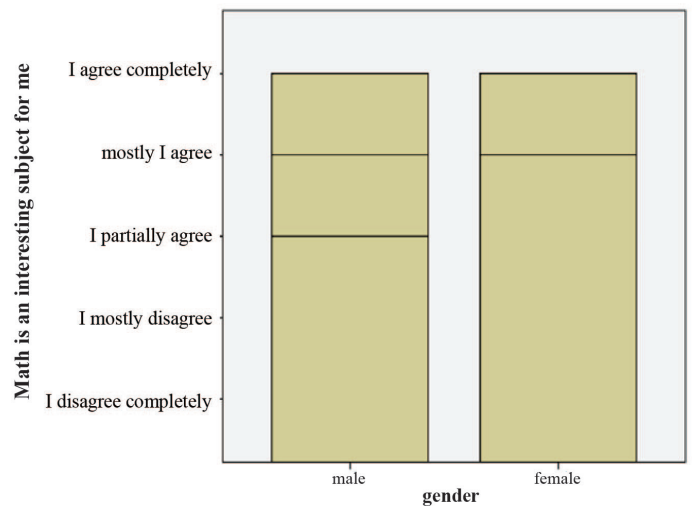
In accordance with the research objective, the relevant parameters of descriptive and inferential statistics were analyzed and presented.

Table 1. Descriptive statistics parameters of this research

Claims	N	Minimum	Maximum	Sum	Mean	Std. Deviation
1. How many students once participated in the competition?	103	1.00	2.00	197.00	1.9126	1.28377
2. Math is an interesting subject for me.	103	1.00	5.00	327.00	3.1748	1.13265
3. The teacher teaches me mathematics in an interesting way.	103	1.00	5.00	324.00	3.1456	1.10620
4. Knowledge of mathematics will be important to me in further education.	103	1.00	5.00	326.00	3.1650	1.07646
5. I am satisfied with my knowledge in mathematics in relation to my abilities, knowledge.	103	1.00	5.00	288.00	2.7961	1.03241
6. I would love to go for additional classes as this expands my knowledg.	103	1.00	5.00	248.00	2.4078	1.07043
7. Only mathematically gifted students go to competition.	103	1.00	5.00	281.00	2.7282	.75659
8. Teachers are interested in organizing additional classes.	103	1.00	5.00	301.00	2.9223	.87098
9. Additional classes burdening students and takes Leisure.	103	1.00	5.00	333.00	3.2330	.79464
10. Due to the overload from extra classes, I neglect other subjects.	103	1.00	5.00	340.00	3.3010	.91646
11. The teacher is willing to help in learning?	103	1.00	5.00	309.00	3.0000	.95998
<b>Valid N (listwise)</b>	<b>103</b>					

The role and importance of additional teaching and competition in mathematics teaching is presented in this paper using 10 points (additional 3 questions are: about the grade at mathematics at the end of the year, about success in school and whether students participated in the competition) with the aim of find out the views of elementary school students on the topic.

The results show that the mean values range from  $M \pm SD = 1.9126 \pm .28377$  for claiming how many students once participated in the competition, to  $M \pm SD = 3.3010 \pm .91646$  for claiming that students due to the overload of the course material, they neglect other subjects.



Histogram 1. Answers to the question "Math is an interesting subject for me"

Responses to the statement “Mathematics is an interesting subject for me” are shown in histogram 1. and the basic indicators of descriptive statistics are shown in table 1. (as for other variables).

The indicators for the mentioned variable are arithmetic mean  $M = 3.17$  with standard error 0.098 and standard deviation  $SD = 0.998$ , the calculated coefficient of variability is 31.63% and with 95% certainty the interval in which the arithmetic mean of the population is between 3.073 and 3.267.

Table 2. Year-end mathematics grade

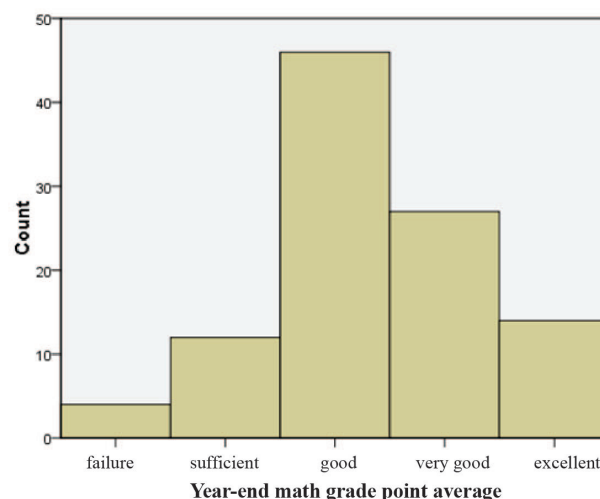
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	failure	4	3.9	3.9	3.9
	sufficient	12	11.7	11.7	15.5
	good	46	44.7	44.7	60.2
	very good	27	26.2	26.2	86.4
	excellent	14	13.6	13.6	100.0
	Total	103	100.0	100.0	

Table 2 provides important and interesting information. The first column contains the categories of the success variables (failure, sufficient, good, very good and excellent. The second column of the Frequency table lists the categories for which the frequencies have been determined and, in addition, the total sample size.

The Percent column speaks of the percent correct representation of grades in students relative to the total number of respondents 103 in our case. And the Valid Percent column speaks of the percentage of students' grades at the end of the year, but this time against the valid number of respondents 103 in the said case.

The Cumulative Percent column gives the cumulative percentages, that is, the sum of the percentages of a given grade with the percentages of the previous grades.

Looking at the following table, we can see that only 14 students out of 103 examinees have an excellent (5) grade in mathematics. The average grade in mathematics is 3 or 44.7%. This is shown in the following histogram 2.



Histogram 2. Year-end math grade point average

Table 3. Teachers are interested in organizing additional classes

Teachers are interested in organizing additional classes		
N	Valid	103
	Missing	0
	Mean	2.9223
	Median	3.0000
	Mode	3.00

The results obtained for the arithmetic mean of Mean correspond to 2.69 children, and for the median and mode 3 indicate below-average interest of teachers in holding additional classes.

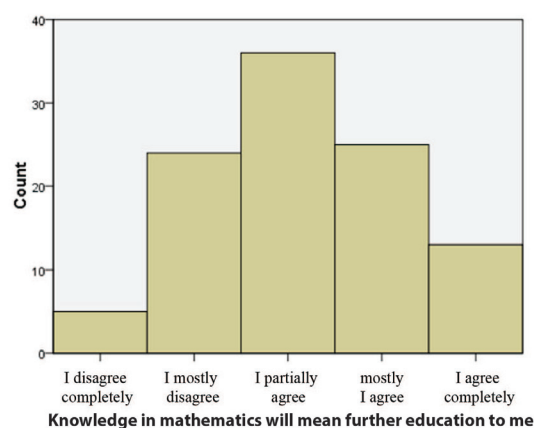
	Frequency	Percent	Valid Percent	Cumulative Percent
I disagree completely	3	2.9	2.9	2.9
mostly disagree	31	30.1	30.1	33.0
I partially agree	43	41.7	41.7	74.8
mostly I agree	23	22.3	22.3	97.1
I agree completely	3	2.9	2.9	100.0
Total	103	100.0	100.0	

Looking at the spreadsheet on whether students think teachers are interested in taking additional classes, we see that 30.1% of them said “mostly disagree” and 41.7% said “partially agree”. This leads us to suspect that teachers are not interested in holding additional classes, either because of the fact that it takes them extra time or because they are not paid or because of inadequate school conditions.

Table 4. Do additional classes take away the student's free time?

	Frequency	Percent	Valid Percent	Cumulative Percent
I disagree completely	1	1.0	1.0	1.0
mostly disagree	14	13.6	13.6	14.6
I partially agree	54	52.4	52.4	67.0
mostly I agree	28	27.2	27.2	94.2
I agree completely	6	5.8	5.8	100.0
Total	103	100.0	100.0	

We can see from the table that only 5.8% of students fully believe that extra classes are taking up their spare time, and 52.4% partially agree. From this we can see that students are not interested in additional teaching because it overloads them, deprives them of their spare time and therefore neglects other subjects. This may be the reason why few students go for additional classes. Although teachers also have a role to play in this, they must encourage students to become more knowledgeable, as this helps them further their education..



Histogram 3. Is knowledge of mathematics important in further education of students?



Students are aware of the importance of mathematics, its content, in further education. And that this is a subject that needs to devote time, learn and practice the material. But it is up to the teachers to develop a desire and desire for mathematics as a subject for the students, to explain the material in a simple way, to organize additional classes and to develop a competitive spirit and will to prepare for and go to competitions.

Table 5. One-way analysis of ANOVA variance for the independent end-of-year assessment variable in mathematics

	Sum of squares	df	Arithmetic mean of the square	F	Sig.
Analysis of different groups	25.361	4	6.340	11.945	.000
Analysis of the same subjects	52.018	98	.531		
Total	77.379	102			

The statistical significance of these deviations is determined by the value of Sig.

Given that the value of  $F = 11,945$  and  $\text{Sig.} = .000$  less than .05, it can be stated in the report that there is a statistically significant difference between the students (considering their grades at the end of the year in mathematics) in terms of whether teachers are willing to organize additional classes.

Table 6. Two-factor univariate analysis of variance - statistical significance, for the dependent variable "I am satisfied with my degree in mathematics, given my abilities"

Source	df	The arithmetic mean of the square	F	Sig.
Corrected Model	15	3.973	7.036	.000
Intercept	1	313.575	555.331	.000
evaluation	4	2.832	5.015	.001
NMPNZN	4	.953	1.688	.160
evaluation * NMPNZN	7	.558	.989	.445
Error	87	.565		
Total	103			
Corrected Total	102			

This table gives us information about statistical significance. The lines in which the grade is written, The teacher teaches me in an interesting way the math and Grade \* NMPNZN, as well as columns F and Sig. They are the data necessary to interpret the results. Within the order of ratings it is seen that the measure  $F = 5.015$  and that it is statistically significant at the level of .05 because  $\text{Sig.} = .001$ , and in the NMPNZN that  $F = 1.688$  with statistical insignificance because

$\text{Sig.} = .160$ . These are the main effects of the grade and NMPNZN on the level of "I am satisfied with my math knowledge" and we see that the grades have statistical significance and the NMPNZN has no significance. In the grade of \* NMPNZN we have the value of statistics  $F = .989$  and its significance  $\text{Sig.} = .445$ , which means that there is no interaction between the grade and NMPNZN regarding the influence on satisfaction with the knowledge in mathematics.

Table 7. Bivariate correlation analysis between the statement “I would like to go for additional classes”

	Correlation	VDNZP	gender
VDNZP	Pearson Correlation	1	.082
	Sig. (2-tailed)		.409
	N	103	103
gender	Pearson Correlation	.082	1
	Sig. (2-tailed)	.409	
	N	103	103

Our example shows that there is a very small correlation between the desire for additional teaching and the gender of students, since  $r = .082$  is very small, suggesting a very weak association.

Significance of Sig. = .409 (no statistically significant correlation) indicates the degree of confidence of the results if the study is repeated.

## DISCUSSION

The results of this study, involving students in grades VI, VII, VIII and IX, totaling 103 students, show that the students confirmed the following statements:

- ◆ Very few students go to additional classes, that is, they once participated in the competition. For the most part, they are excellent students, with a final grade of 5 at the end of the year. Viewed, that's about 2-3 students per class.
- ◆ Students partially (male) and generally agree (female) that mathematics is an interesting subject for them.
- ◆ Most students have a grade of 3 as the closing at the end of the year. From this we see that mathematics is still a difficult subject for students.
- ◆ Opinions were divided as to whether the teacher was willing to assist students in mastering the material. Mostly those with a passing grade of 4 and 5 responded positively, which was expected.
- ◆ Students are satisfied with their math grades, which means that they have no ambition for higher learning intensity and no additional teaching.

- ◆ Only mathematically gifted students want to go to extra classes as this expands their knowledge.
- ◆ Most students find that extra classes are time-consuming and burdensome, while those who go to additional classes do not think so.
- ◆ The survey revealed that teachers are not willing to take additional classes. In some schools, the conditions are not even adequate.
- ◆ Only students who love math would like to go to extra classes. Therefore, we see that there is little interest in students for additional teaching.
- ◆ In terms of research, only mathematically gifted students go to competitions because they want them, with them teachers can achieve better results, and also because of their knowledge and ability, they do not need extra classes but only instruction and guidance, and do the rest at home.

What is important to note is that different answers were given by “better” students, that is, those who love maths, who have 4 or 5 as a final grade and those who go to additional classes and who once participated in the competition, which was taken in the course of conducting the research. Also, the question of whether teachers have the will to organize additional classes is questionable, because it does not depend largely on them, but on the school itself and the students in the class. Where there is poor passing grade, there is also little interest in additional teaching.

There are many factors that influence the organization of additional classes and competitions that need to be considered in the course of the research.

There is not a lot of research work on this topic. One of them we have come to is the work of Tijana Vlahović from the Faculty of Science in Novi Sad, which explored the role of additional teaching and competition from the perspective of competitors and non-competitors. We can say that the data obtained is similar to ours, although its work was conducted on a larger sample of respondents in schools in Serbia. Therefore, the contestants recognize the great importance of additional teaching and competitions in their schooling, support additional classes, like to go to competitions and do not neglect other subjects and school obligations because of it. While non-contestants see opposite answers from competitors.

## CONCLUSION

The role and importance of mathematical competitions in elementary school are too large to be absolutely evocative of a single work. Mathematics sections at school are very useful activities for developing and maintaining an interest in learning mathematics. The analysis and the survey showed that children who love mathematics and have a good final grade, mathematical competitions as well as additional classes in general have multiple meanings. They are aware of its importance in their further education because of this they want to expand their knowledge and go to additional classes. In general, “excellent” students are more committed to school and take it more seriously, and with such children it is easier to work and achieve better results. It is imperative that children understand the importance of mathematics and how widespread it is in mathematics, not only in the natural sciences but also in the social sciences. It is true that mathematics can be developed for its own sake, while only later can we get its application, however, it cannot be disputed that it is necessary as a tool in any science or research. Competition is just one way that can get kids more interested in learning about math and developing their abilities.

Especially gifted children are motivated to compete, because for them, it is a challenge to weigh their

knowledge with students outside their class and in material that goes beyond the standard school curriculum. The situation is different for teachers. There are no mechanisms in place to stimulate teachers to prepare students for the competition. There is also no legal obligation to do this, and teachers themselves, if we exclude the enthusiasm of few individuals, have no interest in competitions. And finally, I would dare to encourage math teachers to devote themselves to mathematically gifted children, to support them, to motivate them, to work with them, because, in addition to helping those children, they thus upgrade themselves and their knowledge. It is no shame that we sometimes learn something from the students as well.

Finally, the importance of mathematics competitions is multifaceted, both because of the children themselves, and because of the quality of our society in the future.

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## THE INFLUENCE OF 4G/5G POLYMORPHISM OF ACTIVATOR INHIBITOR PLASMINOGEN 1 GENE (PAI-1) ON DEVELOPMENT DEEP VEIN THROMBOSIS

Original scientific paper

Maja Podanin<sup>1</sup>

Rifet Terzić

Aldijana Avdić

Amela Jusić

<sup>1</sup> *Biology Department, Faculty of Natural Sciences and Mathematics, University of Tuzla, Bosnia and Herzegovina*

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### ABSTRACT

*Analysis of 4G/5G polymorphisms of PAI-1 gene in interaction with other genetic and external risk factors that induce development of venous thromboembolism can be used for risk assessment for development of venous thromboembolism. Research was conducted on 202 examinees of both genders, older than 18, from north-eastern Bosnia. Experimental group included 100 examinees with diagnosed DVT and 101 examinees who until the sampling procedure did not have diagnosed DVT. In DVT group, following genotype frequencies were determined: 27% of examinees had a normal genotype 5G/5G, 68% are heterozygotes and 5% are mutated homozygotes 4G/4G. In the control group, frequencies of 4G/5G polymorphisms of PAI-1 gene were: 42.6% of examinees have 5G/5G genotype, 55.4% are heterozygotes 4G/5G and 2% are 4G/4G genotype. Obtained results support the hypothesis that PAI-1 in interaction with other genetic and external risk factors probably induces the development of venous thromboembolism.*

**Key words:** polymorphism 4G/5G, PAI-1 gene, venous thromboembolism;

<sup>1</sup> **Correspondence to:**

Maja Podanin, Faculty of Natural Sciences and Mathematics, University of Tuzla, Bosnia and Herzegovina

## INTRODUCTION

Venous thromboembolism (VTE) is one of the leading morbidity and mortality factors in developed countries. Disease can manifest itself through venous system obstruction and most often occurs in deep leg veins (Silverstein et al., 1998). Deep venous thrombosis (DVT) is a disease with yearly incidence of one in 2000 in general population. Incidence is the same in men and women, and it increases with age, especially after 40. Venous thromboembolisms (VTE) occur because of interaction of many different risk factors: acquired, inherited and external factors (De Stefano et al., 1996; Heit and sar., 2000). Risk of occurrence of deep venous thromboembolism rises with the increase of number of risk factors. Nowadays, many risk factors for occurrence of deep venous thrombosis are known, such as: prolonged inactivity, trauma, malicious diseases, age, obesity, estrogen therapy, pregnancy, hyperlipidemia, diabetes, giving a caesarean section birth, confinement up to 6 weeks after giving birth, nephrotic syndrome and other. Most common inherited risk factors are factor V (FV) mutations and prothrombin 20210A mutations, and elevated homocysteine value. (Alfirević and associates, 2010)

Discovery of polymorphisms in promoter region of PAI-1 gene, caused an increase in interest for PAI-1 gene polymorphisms as a genetic risk factor for development of venous thrombosis. 4G/5G insertion/deletion polymorphism is connected to changes of concentration of PAI 1 in plasma and is 25% higher in allele mutation carriers than in wild type individuals (Ye et al., 1995; Eriksson et al., Burzota et al., 1998; Margaglione et al., 1998). In addition, according to researches, 4G allele represents an additional risk factor for development of deep venous thrombosis and myocardium infarcts in younger populations in combination with other risk factors (Eriksson et al., 1995; Tsantes et al., 2007).

## AIMS OF THE RESEARCH

Clinical data of 4G/5G PAI-1 gene polymorphisms are inconsistent and it is unknown whether the similar studies were done in our country, so basic aim of this research is to determine the frequency of genotypes (5G/5G, 4G/5G and 4G/4G) in population of patients with diagnosed venous thromboembolism, and also in the control group of healthy examinees, without known venous thromboembolism risk factors. We also wanted to determine the differences in frequency of 4G/5G polymorphisms regarding the gender and age of examinees, and to determine the possible connection between 4G/5G polymorphisms and occurrence of venous thromboembolisms.

## MATERIALS AND METHODS

Research was carried out on 101 healthy examinees from Tuzla Canton population who did not have known risks for thrombosis (control group) and 100 examinees with diagnosed thromboembolism (DVT group) who were hospitalised in Tuzla University Clinic Center. During the research, ethical standards determined by Helsinki declaration of World Health Organisation (WHO) were honoured. All participants were completely informed about the research protocol, and accepted to participate in the research. All participants were older than 18. Sample of full venous blood was taken from every participant, in the test tube with EDTA anticoagulant (Vacutainer Becton Dickinson, Meylan Cedex, France) on cardiovascular diseases clinic, and samples were preserved at -20°C until they were used in research. DNA isolation and analysis in the researched sample was performed in the Laboratory for scientific work of Biology Department of Faculty of Science of Tuzla University. For DNA isolation was used commercial FlexiGene DNA kit (250) (Qiagen GmbH, Hilden, Germany). Genome DNA was isolated from leucocytes of peripheral blood according to the protocol of FlexiGene DNA Handbook (FlexiGene Handbook Protocol).



Genome DNA check was performed by electrophoresis on 1.5% gel. Area of 98bp PAI-1 gene was amplified by polymerase chain reaction (PCR) according to the protocol (Margaglione et al., 1997). PCR product check was performed by electrophoresis on 4% gel. Electrophoresis lasted 30 minutes with 120 V voltage in 0.5 X TBE buffer. After the electrophoresis, gel was checked and photographed under the UV light (VWR GenoMini, VWR International, BVBA Leuven). Product of PAI-1 Gene amplification of 98bp was then subjected to simultaneous restrictive digestion with BslI restriction enzyme (New England Biolab, The UK). Separation of obtained fragments was performed by electrophoresis on 4% gel, with 80V voltage, lasting 60 minutes.

## RESULTS

In this study we examined the frequency of polymorphism 4G/5G PAI-1 gene in population of examinees with diagnosed venous thromboembolism (DVT) and control group of healthy examinees,

Normal genotype 5G/5G matches the fragment size of 98bp. Mutated 4G/4G genotypes is characterised by two fragments of 77 and 22 bp. Occurrence of all three fragments (98bp, 77p and 22bp) indicate the heterozygote type of 4G/5G PAI-1 polymorphism. For statistical data processing, we used standard statistical package SPSS 15.0 for Windows by SPSS INC. Company and MedCalc 12.4.0.0 (MedCalc Software, Ostend, Belgium). For analysis of distribution of absolute genotype frequencies of individual mutations, and deviation from Hardy-Weinberg equilibrium, we used  $\chi^2$  – test of degree of liberty.

without obvious risk factors for this disease. 5G allele frequency in control group was 70.3%, 4G allele was 29.7%. DVT group has statistically lower frequency of 5G/5G genotype ( $\chi^2 = 6.099$ ,  $p = .021$ ).

*Table 1 Frequencies of genotypes and allele polymorphisms of 4G/5G PAI-1 gene in total sample*

Genotypes	DVT group N (%)	Control group N (%)	Prospect ratio (OR) (95%CI)	<i>p</i>
Normal Heterozygote 5G/5G	27 (27%)	43 (42.6%)		
Heterozygote 4G/5G	68 (68%)	56 (55.4%)	.498 (.276-.901)	.021
Mutated homozygote 4G/4G	5 (5%)	2 (2%)		
Allele 5G	122 (61%)	142 (70.3%)	.660 (.436-1.000)	.050
Allele 4G	78 (39%)	60 (29.7%)		

There is no statistically significant difference in distribution of alleles 5G and 4G between examined groups ( $\chi^2 = 3.853$ ,  $p = .063$ ). Prospect ratio (OR) for genotypes, (4G/4G +4G/5G) to 5G/5G, is .498 (.276-.901, 95% CI) or value for alleles (4G to 5G) is .660

(.436-1.000, 95% CI). Hi-Square test proved that there is no significant difference between men and women, in DVT group, related to genotypes ( $\chi^2 = 3.495$ ,  $p = .100$ ) as well as to alleles ( $\chi^2 = 1.592$ ,  $p = .264$ ).

Table 2 Frequency of alleles and genotypes for polymorphism of 4G/5G PAI-1 gene in relation to gender in DVT group

Genotypes	Male N (%)	Female N (%)	Prospect ratio OR (95%CI)	p
Normal homozygote 5G/5G	16 (36.36%)	11 (19.64%)		
Heterozygote 4G/5G	26 (59.1%)	42 (75%)	.4278 (.173-1.053)	.064
Mutated homozygote 4G/4G	2 (4.54%)	3 (5.36%)		
Allele 5G	58 (65.9%)	64 (57.1%)	.689 (.386-1.229)	.207
Allele 4G	30 (34.1%)	48 (42.9%)		

Prospect ratio (OR), for genotypes, between men and women, in this group was .427 (.173-1.053, 95% CI,  $\chi^2 = 1.622, p = .285$ ), and neither in the allele frequency ( $\chi^2 = .850, p = .444$ ). Prospect ratio (OR) value for genotypes and for alleles .689 (.386-1.229, 95% CI). There was no statistically significant difference between genotype frequencies, between men and women in control group ( $\chi^2 = 1.681 (.753-3.753, 95\% \text{ CI}),$  and for alleles 1.338 (.719-2.491, 95% CI).

Table 3 Frequency of alleles and genotypes for polymorphism of 4G/5G PAI-1 gene in relation to gender in control group

Genotypes	Male N (%)	Female N (%)	Prospect ratio OR (95%CI)	p
Normal homozygote 5G/5G	22 (37.29%)	21 (50%)	1,681 (.753-3.75)	.204
Heterozygote 4G/5G	36 (61.02%)	20 (47.62%)		
Mutated homozygote 4G/4G	1 (1.69%)	1 (2.38%)		
Allele 5G	80 (67.8%)	62 (73.8%)	1,338 (.719-2.491)	.357
Allele 4G	38 (32.2%)	22 (26.2%)		

We have determined that there is no statistically significant difference in distribution frequencies of genotypes between males in DVT and control group ( $\chi^2 = 10.058, p = .003$ ) as well as of allele 4G ( $\chi^2 = .009, p = .913$ ) as well as alleles ( $\chi^2 = .081, p = .893$ ). In contrast to this, in women of DVT group, there is a statistically bigger share of 4G/5G genotype ( $\chi^2 = 5.807, p = .024$ ).

Table 4 Frequency of alleles and genotypes for polymorphism of 4G/5G PAI-1 gene in relation to gender in total sample

Genotypes	DVT Group		Control Group		Prospect Ratio (OR) (95%CI)		p	
	Male N (%)	Female N (%)	Male N (%)	Female N (%)	Male	Female	Male	Female
Normal homozygote 5G/5G	16 (36.36%)	11 (19.64%)	22 (37.29%)	21 (50%)				
Heterozygote 4G/5G	26 (59.1%)	42 (75%)	36 (61.02%)	20 (47.62%)	1.040 (.463-2.3385)	4.090 (1.6721-10.0087)	.923	.002
Mutated homozygote 4G/4G	2 (4.54%)	3 (5.36%)	1 (1.69%)	1 (2.38%)				
Allele 5G	58 (65.9%)	64 (57.1%)	80 (67.8%)	62 (73.8%)	1.088	2.113 (1.1442-3.9045)	.775	.016
Allele 4G	30 (34.2%)	48 (42.9%)	38 (32.2%)	22 (26.2%)	(.606-1.9566)			

Prospect ratio (OR) for genotypes in male population was 1.040 (.463-2.338, 95% CI), and women 4,090 (1.672-10.008, 95% CI). Prospect ratio (OR) for allele in male population was 1,088 (0,606-1,956, 95% CI), and women population was 2.113 (1.144-3.904, 95%

CI). There was no significant difference in relation to age in observed groups in relation to genotypes ( $\chi^2 = 4.778$ ,  $p = .062$ ;  $\chi^2 = .351$ ,  $p = .712$ ;  $\chi^2 = 2.725$ ,  $p = .171$ ), and neither in relation to alleles ( $\chi^2 = 2.53$ ,  $p = .175$ ;  $\chi^2 = .256$ ,  $p = .733$ ;  $\chi^2 = 1.929$ ,  $p = .228$ ).

*Table 5 Frequency of alleles and genotypes for polymorphism of 4G/5G PAI-1 gene in relation to age*

Age	Genotype	DVT group N (%)	Control group N (%)	OR/95%CI)*	p
< 40	Normal genotype/5G	2 (13.33%)	16 (45.71%)	5.473 (1.071-27.951)	.041
	Heterozygote 4G/5G	13 (86.67%)	19 (54.29%)		
	Homozygote 4G/4G	0 (0%)	0 (0%)		
40 – 59	Normal genotype 5G/5G	19 (36.54%)	15 (42.86%)	1,302 (.542-3.126)	.554
	Heterozygote 4G/5G	31 (59.61%)	19 (54.28%)		
	Homozygote 4G/4G	2 (3.85%)	1 (2.86%)		
60 and more	Normal genotype 5G/5G	6 (18.18%)	11 (36.66%)	2,605 (.820-8.26)	.104
	Heterozygote 4G/5G	24 (72.73%)	18 (60%)		
	Homozygote 4G/4G	3 (9.09%)	1 (3.34%)		
< 40	Allele 5G	17 (56.7%)	51 (72.8%)	2.052 (.839-5.017)	.114
	Allele 4G	13 (43.3%)	19 (27.2%)		
40 – 59	Allele 5G	69 (66.3%)	49 (70%)	1,183 (.615-2.274)	.613
	Allele 4G	35 (33.7%)	21 (30%)		
60 and more	Allele 5G	36 (55%)	40 (66.7%)	1.6667 (.8087-3.4347)	.1662
	Allele 4G	30 (45%)	20 (33.3%)		

## DISCUSSION

In our research we determined the 4G allele frequency in DVT group of 39%, and in control group 29.7%, 5% are homozygote mutation carriers 4G/5G PAI-1 in DVT group and 2% in control group. Heterozygote had a frequency of 68% in DVT group and 55.4% in control group. In relation to frequency of 4G allele, our data do not deviate from data from literature. Similarly, frequencies of 5G/5G and 4G/5G genotypes, obtained in this research, are close to those in literature. In our research there is a significant difference in distribution frequency of 5G/5G genotype between the examined groups ( $p = .021$ ). Frequency of homozygote 4G/4G mutation carriers is significantly lower in both groups (DVT 5%, control 2%) than in results of similar studies. In Alfrević et al., (2010) study on 100 DVT patients and 100 healthy examines, frequency of homozygote 4G/4G mutation carriers in DVT group was 31% and 32% in control group. There

were no significantly different results in distribution frequencies of individual genotypes between DVT and control groups. Several different studies showed that 4G/5G polymorphism of PAI-1 gene is a risk factor development of venous thromboembolism. Grubić et al., (1996) examined the association of PAI-1 polymorphism and DVZ in studies of couples carried out on 83 patients with diagnosed DVT and 50 healthy examinees. In patients with VT, the highest level of PAI-1 in plasma was found in individuals with 4G/4G genotype, and the lowest level was in individuals with 5G/5G polymorphism. In contrast to this study, Sartori et al., (1996) had a similar research with 70 DVT patients and 100 healthy examinees, this study determined that prevalence of 5G homozygote carriers was significantly lower (10%) than in control group (26%) ( $p = .009$ ). Ridker et al., (1997), in study carried out on sample of 14916 males did not determine the differences in allele frequency between the VT patients and healthy individuals.

Connection between 4G/5G polymorphisms of PAI-1 gene in Turkish population was researched by Akar et al., (2000). This study of couples observed 127 DVT patients and 113 healthy examinees that constituted the control group. Authors did not find any correlation between PAI-1 genotype and VT. It seems that 4G allele increases the risk for VT in presence of simultaneous inherited polymorphism for factor V Leiden with prospect ratio of 5.5% (95% reliability interval [CI] 1.7-6.3). Similar studies were carried out by Segui et al., (2000). They researched 4G/5G polymorphisms of PAI-1 gene in patients with additional genetic risk factors for development of thromboembolism. Research was carried out on group of 190 patients with diagnosed DVT and 152 control examinees. In this study, there was no difference in distribution of 4G/5G alleles between the DVT patients and control group. However, presence of 4G allele significantly increases the risk of development of thrombosis in patients with other thrombophilic defects (OR 8.14; 95% CI 2.3-28.7). Same study also proved that PAI-1 antigen and values of his activity are higher in patients than in control group and that 4g allele is connected to increased values of PAI-1 plasma in patients. No correlation was found between 4G/5G polymorphisms with level of PAI-1 in control group. We also did not find statistically significant differences in frequency of 4G/5G polymorphisms between male examinees in distribution of genotypes and alleles between the DVT patients and control group examinees, which match the data from literature. In female examinees, we determined statistically significantly higher share of 4G/5G genotype in patients with DVT ( $\chi^2 = 10.058, p = .003$ ) as well as alleles 4G ( $\chi^2 = 5.807, p = .024$ ) compared to control group, which can be explained by small sample size. We also examined the differences in frequency of 4G/5G polymorphisms in relation to age between the examined groups. There was no significant difference in genotype and allele distribution between DVT patients and healthy examinees from control group. Relative risk for development of thrombosis for 4G/4G and 4G/5G genotype carriers in DVT patients in relation to control group examinees with age under 40 is 5.47 (95% CI 1.071-27.951). According to former researches,

4G allele in combination with other risk factors, in younger ages represents and additional risk factor for development of DVT and myocardial infarctions (Eriksson et al., 1995; Tsantes et al., 2005). Our results support the hypotheses that PAI-1 in interaction with other genetic and external factors probably induces the development of venous thromboembolism.

## CONCLUSIONS

Based on the obtained values of frequency of polymorphous 4G allele of polymorphism of PAI-1 in the sample from Tuzla Canton area, we did not confirm the connection between this polymorphism and occurrence of venous thromboembolism. This polymorphism can not be considered as a main risk factor for VT, and its influence on VT should be researched together with other genetic and acquired VT risk factors.

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## FMSLOGO AND SOLVING GEOMETRY PROBLEMS USING THE FMSLOGO SOFTWARE PACKAGE

Original scientific paper

**Sead Rešić<sup>1</sup>**

**Marina Šušnja**

**Ahmed Palić**

**Edisa Korda**

<sup>1</sup> *Department of mathematics, Faculty of Science, University of Tuzla, Bosnia and Herzegovina*

*Elementary school „Busovača“ in Busovača, Bosnia and Herzegovina*

*Faculty of Education, University of Travnik, Bosnia and Herzegovina*

*Elementary school “Turbe “ in Travnik, Bosnia and Herzegovina*

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### ABSTRACT

*This paper presents stereometry (prism) using the software “FMSLogo”, as well as its application and implementation in mathematics teaching. The introductory section describes how to approach mathematical problems according to George Polya. The following describes the creation, installation and use of the “FMSLog” software. At the very end of the paper are the research settings and its results, which through the empirical model shows the current state of affairs and therefore provides recommendations for its improvement.*

**Keywords:** *FMSLogo, Logo, geometry, planimetry, stereometry, prism*

<sup>1</sup> **Correspondence to:**

Sead Rešić, Department of Mathematics, Faculty of Science, University of Tuzla, Bosnia and Herzegovina  
Univerzitetska 4, 75000 Tuzla, Bosnia and Herzegovina

Phone: +387 61 101 230

E-mail: [sresic@hotmail.com](mailto:sresic@hotmail.com)

## INTRODUCTION

Contemporary teaching approaches aim to put theoretical knowledge into practice. Interactive classroom content uses computer programs and equipment to visualize the process. One of the most important goals of studying mathematics is to teach students to think, that is, to enable them to solve problems in their future lives. In his work, the mathematician George Polya talks about solving mathematical problems in four steps: a problem, making a plan, executing a plan, and looking back. (Ovčar S., 78.) Every mathematical problem needs to be identified, a plan for its solution must be made, it is examined if that plan of solution is feasible, if so, and ultimately a solution to the problem. Interactive approach solving is applied in this model.

Various mathematical software is intended for innovative, interactive and dynamic teaching of different areas of mathematics. FMS Logo is a programming language that has an educational purpose. It is designed for constructivist learning by Daniel G. Bobrow, Wally Feurzeig and Seymour Papert. He is best known for his “turtle graphics”. The logo can be used to teach the concept of computer science. Its features are: modularity, scalability, interactivity and flexibility. This programming language is characterized by the use of the Turtle Logo, which moves the trail. Logo is a dynamic geometric system. Allows you to draw geometric shapes according to the given dimensions and coordinates. The logo was developed to help children develop logical thinking and to more easily perceive the shapes around them.

This programming language also provides opportunities for cooperative learning, which is a good choice of modes for many mathematical fields. The primary role of the teacher is not to teach, explain or otherwise transfer knowledge, but to create situations that will allow students to think and reason logically. This programming language allows you to visualize math, interactive distance lessons, and various applications of math. Geometry has always been a favorite mathematical branch because of its vividness.

The geometric body, ie its model, can be seen, touched, made, presented, therefore fully experienced.<sup>2</sup>

A 6-7 year old child is best placed in the subject world, so it is reasonable to believe that mathematics classes should begin with geometric contents - shapes in space or geometric bodies. Almost all methodologists point out that the development of logical thinking is the most important in teaching mathematics. Logical thinking means the application of formal logical operations in the process of thinking, arranging, and systematizing the material studied using the laws of logic. “Technology development has led to advancements in many fields, so technology was expected to have a major impact on teaching. Despite the many benefits of using technology in mathematics education, the process of integrating technology in classrooms has proven to be slow and complex.” (Hohenwarter, Hohenwarter, Kreis & Lavicza, 2008).

The name of this programming language is derived from the Greek word “logos” which means thought in translation. The first version of this program was made back in 1967 at the American University MIT (Massachusetts Institute of Technology). One of the creators of this programming language was the famous mathematician Seymour Papert.

Programming Language Logo has been developing and improving. There are different versions of this programming language today, and many of them are free to use. This programming language can be used in mathematics, biology, physics, languages, music, robotics and in science. The logo enables the creation of simulations and multimedia presentations. This programming language does not require much knowledge at first, and there are many options. Because of its simplicity, it is easy for beginners to use, while providing more sophisticated research and projects for experienced users.

Geometry is a scientific discipline that dates back to ancient civilization. The very word geometry dates back to ancient times when it meant measuring the earth or measuring it. Ever since the ancient civilizations of Sumerians, Egyptians, Babylonians and other nations, people have had knowledge of angles, triangles, quadrilaterals...

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<sup>2</sup> Defining initial geometric terms: <http://marul.ffst.hr/~logika/content15.htm>

Geometry developed as an inductive science, which, with the help of empirics and different senses, was upgraded, that is, from individual cognitions some general ones were derived. Ancient Greeks in the 6th c. have begun to study geometry in greater detail.

All knowledge acquired from other peoples is systematized and verified ie proved. The deductive way of proving geometric claims came first from the philosopher Tales. These Tales writings do not exist, which is why it cannot be claimed that he was able to prove some of his claims. According to his philosophical claims, geometric objects are identified with physical ones, and physical motions are used to prove geometric claims. The ancient Greek philosopher and mathematician Pythagoras used to prove geometric claims. His great contribution is to the study of geometry and to the theory of large numbers. Pythagoras' most famous theorem is: "The area of a square above the hypotenuse of a right triangle equals the sum of the areas of a square above the catheters." (Dadić Ž., 32.)

Euclid was most important for geometry in his work Elements. This section describes the space we live in. The "elements" consist of 13 books, where the first 6 refer to planimetry, the next 4 to geometric number theory, and the last 3 to stereometry. These books are usually accompanied by 2 shorter book monographs. These books are considered by many to be extensions of the "Elements". Throughout history it is revealed that the first book was written by a pupil of Euclid the Hipsikle of Alexandria, and the second by an unknown author. Euclid used a deductive way of proving and arguing geometry. In order to use the deductive method, it is necessary to use logical thinking and perception. (Dadić Ž., 69.)

Planimetry is part of elementary geometry that studies the properties of geometric figures in the Euclidean plane. The basic planimetric elements are sets of points, direction, length, angle, circle and circle. They are more complex than the basic elements; geometric figures and geometrical shapes.

Stereometry was also used for this research, so something will be said briefly. Stereometry is a

part of geometry that deals with the examination of geometric bodies and shapes, which are located in space. Elementary school students learn stereometry in the eighth grade of eight-year school or in the ninth grade of nine-year-olds. The first topic addressed is the relation of direction and plane, the relationship of two directions, and the relationship of two planes. The study of directions and planes is performed using the cube and square model, the relationship of the edges and the relationship of the sides on the cube and square model are studied. These are basic lessons in space geometry. This whole is completed by processing by processing the orthogonal projection of a point on the plane and the distance of the point from the plane. After this area, students begin to study geometric bodies and their properties. Teachers use models of geometric bodies to aid learning. A geometric body is a part of a space bounded by surfaces, and consists of points that perish in the same plane.

In everyday life we come across many objects that have some geometric shape. Because of this, students learn to distinguish geometric bodies, their surfaces and edges using models. The bodies being treated are prisms (regular upright prisms), pyramids (upright pyramids), upright roller, cone and ball. The numerical magnitudes explain the computation of the area and volume of each geometric body. It is difficult for students to present a 3D representation of geometric bodies, which is why most teachers and professors in this field reduce students to calculating unknown sizes using formulas, which is not quite correct for such a lesson. Each student has the creativity that should be used to learn the properties of geometric bodies through practical work, such as making models of prisms, pyramids, rollers, or balls, or to calculate area or volume using a model made. In order to be able to apply the practical work in these lessons, it is necessary for students to have the foreknowledge of the geometric figures they need to create the body networks.

One practical example: based on a four-sided prism model, the area needs to be calculated - students must first disassemble a geometric body made of paper and plastic. Once disassembled, they will receive a prism net.

They will then determine what its sides are and what its base is. After these established facts, they will be able to measure the required lengths and solve the task.

By logical inference after the model is made, and then the disassembled model is finished, we can say that the surface of the geometric body is the surface of the mesh of that body. In order to make it easier for students to understand what the volume of a body is, it is easiest to explain it by an example of a cube, for example, during the introductory lesson, students can be shown a model of a cube with a length of 1 cm, 1 dm and 1 m. given the length of the edge of the cube.

In my research, I worked with students on the part of stereometry, a chapter called prisms. For the purposes of working with the experimental group, IT equipment with the software “FMSLogo” was used. In the introductory lesson it was necessary to repeat the geometric figures:

- Triangle - equilateral, versatile, isosceles, pointed, rectangular and obtuse
- square - square, rectangle, parallelogram, rhombus
- polygon - regular pentagon, hexagon, n-triangle
- circle and circle

*Table 1. Mann-Whitney Test*

Ranks				
	Group	N	Mean Rank	Sum of Ranks
sum of initial	Experimental	33	37.61	1241.00
	Control	34	30.50	1037.00
	Total	67		
Test Statistics <sup>a</sup>				
	sum of initial			
	Mann-Whitney U			
	442.000			
	Wilcoxon W			
	1037.000			
	Z			
	-1.497			
	Asymp. Sig. (2-tailed)			
	.134			

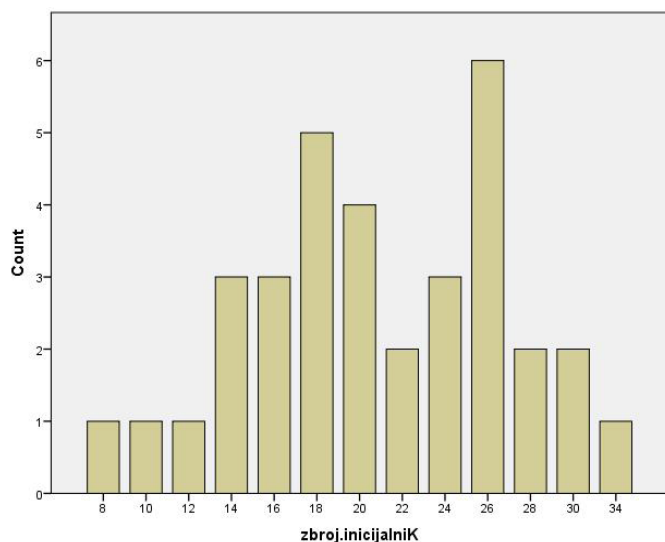
a. Grouping Variable: Group

The first table (Ranks) shows the respondents by groups. The second table (Test Statistics) has a Mann-Whitney U test value of 442.000 and a significance value of .134. Based on these results, it can be concluded that there is no statistically significant

## ANALYSIS AND INTERPRETATION OF RESEARCH

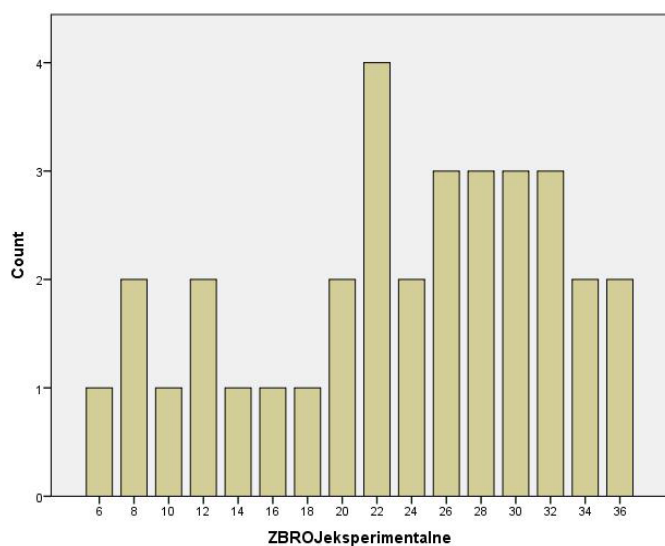
Before starting the research, it was necessary to divide the students into two groups. Since this is an experimental research, one group treated the lessons with the help of IT equipment, and with the other group in a classic way with the help of geometric accessories. The experimental group had 33 students, of which there were 16 girls and 17 boys. The control group had 34 students, of which there were 16 girls and 18 boys. Initial testing was performed with both groups on the first lesson to determine if the groups were uniform. It was important that in both groups the level of knowledge was approximate.

difference between the groups in the initial testing. First sub-hypothesis: It is assumed that students have a basic background in geometry (ie they know how to distinguish geometric shapes)



Graph 1. Initial control group teste

From Graph 1 we see that one student scored the lowest number of points (8 points) and one student scored the highest number of points (34 points). The same number of students won the lowest and highest points. Other students had average knowledge. The control group scored 712 points in total, averaging 20.94 points per student.

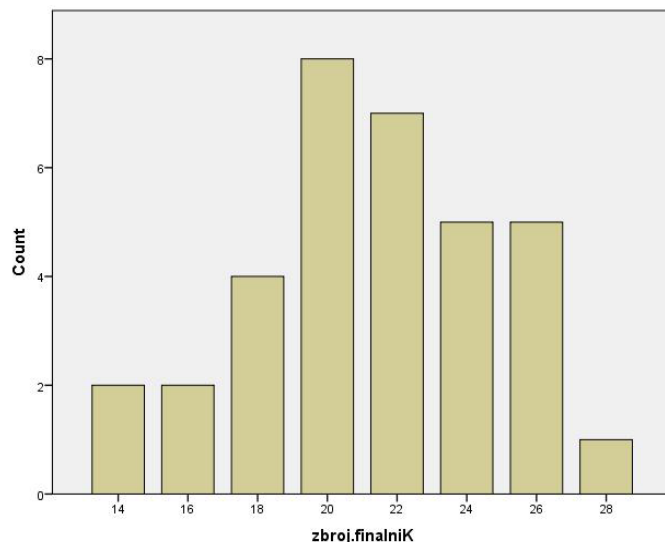


Graph 2. Initial test of the experimental group

From Graph 2 we see that one student scored the lowest number of points (6 points) and two students scored the highest number of points (36 points). The difference between the number of students who had the lowest score and the highest score is one. Other students had average knowledge. The experimental group scored a total of 768 points, averaging 23.27 points per student.

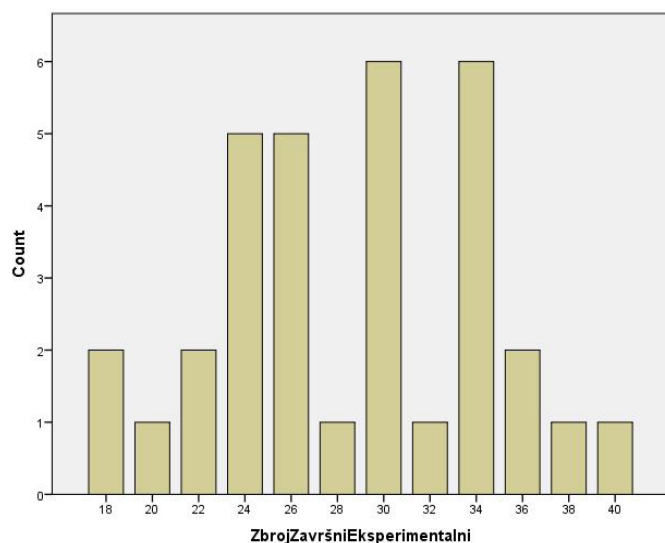
From the previous two graphs we can see that the students have a satisfactory level of knowledge, ie on average, each student earns half a point out of the total number.

Second sub-hypothesis: It is assumed that the application of FMS Logo software results in better results on geometric units.



Graph 3. Final control group test

From Graph 3. we see that two students scored the lowest number of points (14 points) and one student scored the highest number of points (28 points). The difference between the number of students who had the lowest score and the highest score is one. Other students had average knowledge. The control group scored 724 points in total, averaging 21.29 points per student.



Graph 4. Final test of the experimental group



From Graph 4. we see that two students scored the lowest score (18 points) and one student scored the highest score (40 points). The difference between the number of students who had the lowest score and the highest score is one. Other students had average knowledge.

The control group scored 944 points in total, averaging 28.61 points per student.

We can see from the graphs that the experimental group had a total of more points than the control group.

Table 2. Mann-Whitney Test

Ranks				
	Group	N	Mean Rank	Sum of Ranks
sum.initial	Experimental	33	37,61	1241,00
	Control	34	30,50	1037,00
	Total	67		
sum.total	Experimental	33	45,92	1515,50
	Control	34	22,43	762,50
	Total	67		

Test Statistics <sup>a</sup>		
	sum.initial	sum.total
Mann-Whitney U	442,000	167,500
Wilcoxon W	1037,000	762,500
Z	-1,497	-4,969
Asymp. Sig. (2-tailed)	,134	,000

a. Grouping Variable: Group

The first table (Ranks) shows the respondents by groups. In the second table (Test Statistics) is the value of the Mann-Whitney U test, for the final test, which is 167,500 and its significance is 0.000. Based on these results, it can be concluded that there is a statistically significant difference between the groups in the final examination.

Table 3. Results of descriptive and inferential statistics for the experimental and control group

Claim (question)			Experimental Group				Control group			
			M	SD	t-test	p	M	SD	t-test	p
1.	TASK 1	I	2.36	1.454	.058	.747	2.12	1.552	.049	.781
		F	2.73	1.206			2.29	1.115		
2.	TASK 2	I	2.36	1.454	.418	.015	2.18	1.242	-	.602
		F	2.85	1.121			2.76	1.208		
3.	TASK 3	I	2.36	1.617	.382	.028	1.65	1.252	.118	.507
		F	3.15	1.121			1.65	.774		
4.	TASK 4	I	2.30	1.591	.462	.007	1.41	1.048	.459	.006
		F	2.61	1.273			1.35	.950		
5.	TASK 5	I	2.36	1.537	.549	.001	1.35	1.368	.234	.183
		F	2.73	1.306			1.41	1.048		
6.	TASK 6	I	2.24	1.393	.578	.000	2.18	1.242	-	.828
		F	2.67	1.190			2.29	1.115		
7.	TASK 7	I	2.73	1.398	.380	.029	2.65	1.454	.243	.166
		F	3.21	1.111			2.41	1.282		
8.	TASK 8	I	2.18	1.685	.472	.006	2.76	1.394	.188	.288
		F	3.03	1.015			2.41	1.076		
9.	TASK 9	I	2.24	1.562	.374	.032	2.35	1.515	.291	.095
		F	3.15	1.004			2.24	1.182		
10.	TASK 10	I	2.12	1.495	.537	.001	2.29	1.643	.103	.563
		F	2.48	1.326			2.47	1.308		
	THE SUM OF ALL QUESTIONS	I	23.27	8.658	.891	.000	20.94	6.154	.437	.010
	THE SUM OF ALL CLAIMS	F	28.61	5.733			21.29	3.546		

#### Experimental group:

A value of  $t = .058$  as well as its significance of  $.747$  above the cut-off value of  $.05$  indicates that there is no statistically significant difference between initial and final testing for the first task.

A value of  $t = .418$  as well as its significance of  $.015$  which is below the cut-off value of  $.05$  indicates that

there is a statistically significant difference between initial and final testing for the second task.

A value of  $t = .382$  as well as its significance of  $.028$  which is below the cutoff value of  $.05$  indicates that there is a statistically significant difference between initial and final testing for the third task.

A value of  $t = .462$  as well as its significance of  $.007$  which is below the cut-off value of  $0.05$  indicates that there is a statistically significant difference between initial and final testing for the fourth task.

A value of  $t = .549$  as well as its significance of  $.001$  below the cut-off value of  $.05$  indicates that there is a statistically significant difference between initial and final testing for the fifth task.

The value of  $t = .578$  as well as its significance of  $.000$  below the threshold  $.05$  indicates that there is a statistically significant difference between initial and final testing for the sixth task.

A value of  $t = .380$  as well as its significance of  $.029$  which is below the cut-off value of  $0.05$  indicates that there is a statistically significant difference between initial and final testing for the seventh task.

A value of  $t = .472$  as well as its significance of  $.006$  which is below the  $.05$  threshold indicates that there is a statistically significant difference between initial and final testing for the eighth task.

A value of  $t = .374$  and a significance of  $.032$  below the cut-off value of  $0.05$  indicates that there is a statistically significant difference between initial and final testing for the ninth task.

A value of  $t = .537$  and a significance of  $.001$  below the cut-off value of  $.05$  indicates that there is a statistically significant difference between initial and final testing for the tenth task.

#### **Control group:**

A value of  $t = .049$  as well as its significance of  $.781$  above the cutoff value of  $.05$  indicates that there is no statistically significant difference between initial and final testing for the first task.

A value of  $t = -.093$  as well as its significance of  $.602$  above the cut-off value of  $.05$  indicates that there is no statistically significant difference between initial and final testing for the second task.

A value of  $t = .118$  as well as its significance of  $.507$  above the cut-off value of  $.05$  indicates that there is no statistically significant difference between initial and final testing for the third task.

A value of  $t = .459$  as well as its significance of  $.006$  below the cut-off value of  $.05$  indicates that there is a

statistically significant difference between initial and final testing for the fourth task.

A value of  $t = .234$  as well as its significance of  $.183$  above the cut-off value of  $.05$  indicates that there is no statistically significant difference between initial and final testing for the fifth task.

A value of  $t = -.039$  as well as its significance of  $.828$  above the cut-off value of  $.05$  indicates that there is no statistically significant difference between initial and final testing for the sixth task.

A value of  $t = .243$  as well as its significance of  $.166$  above the cut-off value of  $.05$  indicates that there is no statistically significant difference between initial and final testing for the seventh task.

A value of  $t = .188$  and its significance of  $.288$  above the cut-off value of  $.05$  indicates that there is no statistically significant difference between initial and final testing for the eighth task.

A value of  $t = .291$  as well as its significance of  $.095$  above the cut-off value of  $.05$  indicates that there is no statistically significant difference between initial and final testing for the ninth task.

A value of  $t = .103$  as well as its significance of  $.563$  above the cut-off value of  $.05$  indicates that there is no statistically significant difference between initial and final testing for the tenth task.

In the second and sixth tasks, the value of the t-test is negative (- sign), and the advantage is on the final testing side.

Looking at Tables 2 and 3 we can conclude that there is a statistically significant difference between the control and experimental groups. The experimental group performed better than the control group. This proves the second sub-hypothesis.

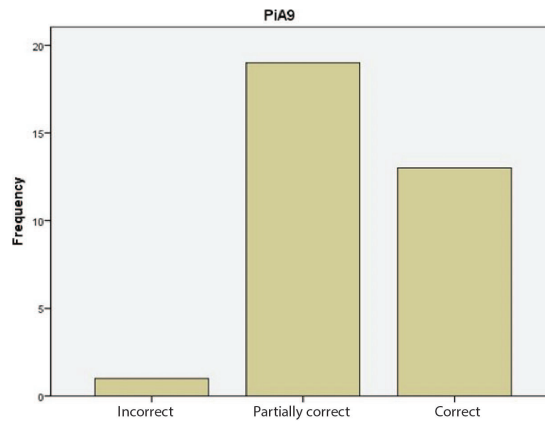
**Third subhypothesis:** It is assumed that the application of FMS Logo software on geometric units creates student satisfaction.

Question: This mode is appropriate for a better understanding of mathematics

Table 4. Results of the ninth question

PiA9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Incorrectly	1	3.0	3.0	3.0
	Partly correct	19	57.6	57.6	60.6
	Correct	13	39.4	39.4	100.0
	Total	33	100.0	100.0	



Graph 5. Results of the ninth question

By examining, 19 students out of 33 partially agree with this statement, while 13 students completely agree with it. From this I can conclude that the use of IT equipment has a positive effect on the course of the lesson, and the children better understand the material.

Sub-hypothesis 4: It is assumed that the application of FMS Who software creates a high degree of satisfaction.

Question: The way the material is interpreted is interesting and motivating

Table 5. Results of 2. claims / questions

PiA2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Incorrectly	7	21.2	21.2	21.2
	Partly correct	10	30.3	30.3	51.5
	Correct	16	48.5	48.5	100.0
	Total	33	100.0	100.0	

Of the 33 respondents, 7 (21.2%) considered the statement to be inaccurate, 10 (30.3%) believed the statement to be partially true and 16 (48.5%) that the statement of completeness was true. From this we can

see that most of the respondents think that this way of interpreting the material is interesting and motivating.

Question: Using the FMS Logo software allows you to better understand the material

Table 6. Results of 4.claims

PiA4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Incorrectly	8	24.2	24.2	24.2
	Partly correct	9	27.3	27.3	51.5
	Correct	16	48.5	48.5	100.0
	Total	33	100.0	100.0	

Of the 33 respondents, 8 (24.2%) thought the statement “FMSLog” software enables a better understanding to be inaccurate, 9 (27.3%) that the statement was of the material. partially true and 16 (48.5%) that the statement of Question: Presenting material through the “FMS completeness was true. From this we can see that Logo” software is interesting, and independent use is the majority of respondents think that the use of possible and easy

Table 7. Results of 5th claim

PiA5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Incorrectly	10	30.3	30.3	30.3
	Partly correct	14	42.4	42.4	72.7
	Correct	9	27.3	27.3	100.0
	Total	33	100.0	100.0	

Of the 33 respondents, 10 (30.3%) thought the use of the “FMSLogo” software is interesting and statement to be inaccurate, 14 (42.4%) that the easy to use independently. statement was partially true and 9 (27.3%) that the Question: Students are mostly actively involved in statement was completely true. From this we can see work through conversation, task design, hands-on that the majority of respondents partly think that the work, and student presentations

Table 8. Results of claim 7

PiA7

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Incorrectly	5	15.2	15.2	15.2
	Partly correct	22	66.7	66.7	81.8
	Correct	6	18.2	18.2	100.0
	Total	33	100.0	100.0	

Of the 33 respondents, 5 (15.2%) thought the statement Based on the results from the above tables, I can to be inaccurate, 22 (66.7%) said the statement to conclude that the use of “FMSLOG” software creates to be partially true and 6 (18.2%) that the statement a high degree of student satisfaction. was completely true. From this we can see that the Fifth sub-hypothesis: It is assumed that there is no majority of students are active on the class and that difference in degree of satisfaction with respect to they independently approach all the tasks in the work. gender



Table 9. Mann- Whitney test

Ranks				
	Group	N	Mean Rank	Sum of Ranks
sum	Experimental	16	17,72	283,50
	Control	17	16,32	277,50
	Total	33		
Test Statistics <sup>a</sup>				
			sum	
	Mann-Whitney U		124.500	
	Wilcoxon W		277.500	
	Z		-.420	
	Asymp. Sig. (2-tailed)		.674	
	Exact Sig. [2*(1-tailed Sig.)]		.683 <sup>b</sup>	

a. Grouping Variable: gender

b. Not corrected for ties.

The first table gives us information about respondents by gender. The Mann-Whitney U value of the test is 124.500 and has a significance of .683, on the basis of which we can conclude that there is no difference in the degree of satisfaction in boys and girls when using the software “FMSLogo” in mathematics lessons. This proves the fifth sub-hypothesis.

Having proved all the supporting hypotheses, we can conclude that the use of FMSLogo has had a positive effect on students.

## CONCLUSION

In this paper, we investigated the impact of the application of “FMSLogo” software during the teaching of stereometry material. The research began with the initial testing, which I wanted to check on the pre-knowledge of ninth grade students. It was important for the research setting that both groups have a uniform background. After the initial test, the control group was taught the material in stereometry in the standard way, while the experimental group used the software “FMSLogo” when teaching. After completion of the experiment, a retest was performed,

both groups performing the same final test. The experimental group also did a survey to show if students were satisfied with the use of FMSLogo software in math classes. After analyzing and interpreting the results of the testing and the survey, we have come to the conclusion that the application of the “FMSLog” in the classes where stereometry is taught has a positive impact on the students. Students are more motivated to work, achieve better results, the atmosphere during the class is relaxed, students are more active during the class.

This kind of work of teachers and professors requires that he / she be educated in the use of computer equipment and educational software while teaching. I think that math teachers should be educated on not only the FMSLogo software but also some others that would help students to understand the math material more easily. In addition to education, teachers need to be equipped with schools, not all schools are equipped with a sufficient number of projectors and computers.

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## PERSPECTIVES AND CHALLENGES OF INTERPROFESSIONAL WORK IN INSTITUTIONS FOR THE ELDERLY

Review article

Sabira Gadžo-Šašić<sup>1</sup>

Ivana Ristić<sup>2</sup>

*Department of Social Work, Faculty of Political Sciences, University of Sarajevo, Bosnia and Herzegovina  
College of Social Work, Belgrade, Serbia*

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### ABSTRACT

*The main characteristic of the 21<sup>st</sup> century is the increase in the number of third-age persons in the total human population of the world. Therefore, it is an imperative to create new modes and to improve existing modes of assistance and support to this group of people. This paper specifically seeks to draw attention to possible directions for the development of care services for the elderly. The tasks of the professionals (social workers and occupational therapists), working in institutions for the permanent placement/accommodation and care of the elderly, were also analyzed. In addition to the above-mentioned, the status of the elderly population in Bosnia and Herzegovina and Serbia has been reviewed.*

**Keywords:** social work, occupational therapy, the elderly, institutions

### <sup>1</sup> Correspondence to:

Sabira Gadžo-Šašić, Assistant Professor, Department of Social Work, Faculty of Political Sciences, University of Sarajevo, Bosnia and Herzegovina

Skenderija 72, 71 000 Sarajevo, Bosnia and Herzegovina

E-mail: [sabira.gadzo.sasic@fpn.unsa.ba](mailto:sabira.gadzo.sasic@fpn.unsa.ba)

<sup>2</sup> Ivana Ristić, Assistant Professor, College of Social Work, Belgrade, Serbia

E-mail: [ivana.ristic@asp.edu.rs](mailto:ivana.ristic@asp.edu.rs)

## INTRODUCTION

The ever-increasing growth rate of the elderly population in the total population number of the world is certainly one of the most important features of the 20<sup>th</sup> and especially the 21<sup>st</sup> century. Such trend poses an increasing for professionals, to create new measures and services that would enrich existing modalities to help this group of people. Considering the aforementioned, it is not surprising that the European Union (Active aging and solidarity between generations – statistical portrait of the European Union, 2012) has declared the year 2012, the Year of Active Aging and Intergenerational Solidarity. The EU set following objectives for that year: Raising awareness on the value of active aging, highlighting the contribution that older people can make to the society, the economy and in particular, mobilizing overall potential; exchange of ideas and good practices on how to promote active aging policies and solidarity between generations; to offer a framework for action to enable Member States and interested parties to develop policies and concrete activities to encourage active aging (Štambuk; Sučić, 2014). It can be stated that even today- seven years after the adoption- these objectives present a challenge. In order to create an environment that would provide an adequate framework for completing at least some of the objectives, all societies should be focused on creating measures, models and policies that should improve services for the elderly population, especially because the elderly are a group of socially excluded people, who have not acquired specially-prescribed rights such as children, women and persons with disabilities.

Therefore, despite predictions that by 2030 there will be one in four people over the age of 60, this socially excluded group has not received particular public attention-with the aim of creating an environment conducive to greater social inclusion of elderly.

Nevertheless, many countries are currently reviewing their policies in light of the principle that elderly are a valuable and important component of a society. Demographic changes that are evident in the increasing proportion of the elderly population in

the total population are widespread in Bosnia and Herzegovina, Serbia, as well as in the rest of the region. In Bosnia and Herzegovina, this is an issue that has been recognized in development documents since the first Development Strategy of Bosnia and Herzegovina, and it is still present in new development documents - including the Social Inclusion Strategy that has been adopted by the Federation of Bosnia and Herzegovina and the Brčko District. However, it is a devastating fact that the quality of life and well-being of the elderly population has not reached the required level. As for the situation in the Republic of Serbia, according to the Statistical Office of the Republic of Serbia in 2016, 7,058,322 inhabitants were registered, and the population aged 65 and over comprised 19% of the total population. At that time, 57.5% of the elderly population were women. This information in itself speaks of the necessity of involving all structures in the creation of a support network for this group of people, which, in addition to being more numerous, is also becoming more excluded.

It can be concluded, that in creating new approaches to providing assistance to this group of inhabitants in the countries in the region, a special place should belong to the creation of innovative modalities for improving the quality of life and well-being of the elderly, especially those that are housed/accommodated in care institutions. Moreover, in societies where loneliness is increasingly perceived as the number one problem, an increasing number of third-age persons can be expected to express a desire to be placed/accommodated in a care institution with the aim of overcoming problems - especially loneliness.

### **Social work and occupational therapy with the elderly, with special reference to their importance in residential care institutions**

Although various definitions of social work as an academic discipline and practical social activity can be found in the professional literature, the starting point of all these definitions is the set of efforts put in by professionals to achieve greater social development, that is, the well-being of all people.

When pursuing better well-being for the elderly (especially in institutions for the permanent accommodation and care of such persons) the science of occupation is important. It focuses on research aimed at examining patterns and traits of purposeful and meaningful activities that people engage in throughout their lives, as well as their links to the health and progress of not only individuals, groups of people but also the entire community. It has the ultimate aim of improving the quality of life (Law et al, 2002; Zemke & Clark, 1996). In this regard, the overlapping between the scientific fields of social work and occupational therapy implies the importance of quality of interprofessional collaborative work in practice.

Following all the above, on the one hand, social work practice is oriented towards meeting human needs and developing human resources (Gadžo-Šašić, 2019) (especially of marginal group), in which elderly undoubtedly have a special place. On the other hand, activities of occupational practices in the field of work with the elderly are oriented at assisting the elderly with the aim of training for independent living.

Of course, this begs the question of why in modern societies the elderly are so excluded from social processes, and why do they need the continued support of professionals (social workers, occupational therapists)? In seeking the right answer, we should note that, unlike earlier social structures that were based on the rules of the so-called gerontocracy (where the elderly were the center of attention and decision-making), in modern civilizations, younger people take on this role. On the one hand, such environment contributes to the growing prejudice of old age and aging as something that is negative and on the other, it leads to the idealization of "youth".

In addition, all modern societies share the fate of the negative demographic changes that are manifested by increasing the proportion of the elderly in the total population, primarily due to the prolonged life expectancy of the person as well as the decreased birth rate. According to the authors (Haverka; Despot Lučanin; Lučanin, 2000), this trend will culminate by 2030, especially in developed societies. We also should not forget the ubiquitous trend of the so-called

"atomization" of the family, which contributes to the deepening of the problems of the elderly who, due to this trend, are increasingly feeling lonely and left to themselves. The described social context contributes to the growing alienation of older members of the society, and topics that directly concern them become taboos. Thus, communication of third-age persons about everything that seems important to them (retirement, property, real estate, life support, loneliness, accommodation in an institution, seeking help in everyday life that is often very monotonous and troublesome) comes down to sporadic conversations with their peers, with little or no discussion of these topics in public. The reason for this is the fact that older people feel afraid that they will be accused of being selfish, but also because of the fear that they will experience inconvenience if they request humane treatments. In such an atmosphere, an environment is created in which social workers and occupational therapists are becoming expert figures, which are increasingly challenged to find different solutions to overcome these problems. In fact, social workers as professionals should act as spokespersons for the problems and needs of the elderly. In this regard, they should advocate the rights and opportunities of the elderly, to inform the elderly of their rights, to work to create activities in local communities that aim at greater involvement of the elderly in everyday life. We can conclude that social workers and occupational therapists, through interprofessional collaborative work in practice, have an obligation to create activities that will enable third-age persons a quality life in their own home. This should be primarily implemented for the elderly who, despite a developed and open model of elderly care, are unable to live a decent life in their own household. The aforementioned professionals have to enable a quality and dignified life through the realization of different approaches in institutions that should be designed as institutions offering permanent or temporary accommodation for the elderly.



In these institutions, professionals of social work and occupation therapy are particularly prominent professions, because the defined primary task of these professionals (social workers and occupational therapists) is to invest efforts that should make the elderly feel active and useful members of the society despite accommodation in an institution. Here, professionals face a particularly great challenge because they have a task to break the prejudices that prevail among these categories - that despite the developed opinion of social exclusion due to calendar age, accommodation in such an institution makes them even more excluded from social events. Due to the above, the literature cites several roles played by the social worker and occupational therapist in working with institutional care users. Some of these roles are: Providing information and encouraging care users to make choices and make independent decisions; assisting in the formation of care user councils; involvement of care users in decision-making processes and the formation of self-help groups (Štambuk; Sučić, 2014, according to KorenaDoron, 2005). The implementation of these measures is especially hampered by the fact that accommodation in an (elderly) institution is considered shameful, and younger family members run the risk of declaring themselves bad relatives. The misinterpretation of life in such institutions is the thing that makes working with elderly hard. This happens because among third-age persons there is a common opinion that a care institution is a place where they will die. This makes it difficult for professionals to create attitudes about institutional life as a place where the elderly can live harmoniously, socialize and spend quality time. All this contributes to the fact that continuous work with the elderly leads to the so-called "burn out syndrome". The constant struggle for the rights of the third-age persons as well as the continuous development of ideas that can contribute to improving the quality of life of those who are accommodated in an institution or who are forgotten in the community – this often reminds the professionals themselves of their own transience and makes them think about

the possibility that they will find themselves in the same or a similar position. That is the primary reason for highlighting/advocating specialization in social work and occupational therapy with the elderly. Specialization in this field as an important challenge for the profession is increasingly emphasized today (Mali, 2013), although most curricula that educate social workers include the subject Social work with the elderly. This is imposed as an obligation due to the fact that, for most professionals who continue to work with third-age persons, it is necessary to provide additional, continuing education, which would be a form of empowerment and information on new trends in working with this group of people. Specialization includes the development of competencies for working with the elderly, as well as developing the ability to create campaigns aimed at raising public awareness of the needs and rights of the elderly and the social and individual consequences of violating these rights. These activities would also encourage the participation of the elderly in life of the local community and provide conditions where (by exercising their rights and acquiring new knowledge and skills) seniors would remain active participants in the community and would be recognized as an important resource of social change, wherever they live (in their own household or accommodated in institutions for the elderly). The primary goal of cooperation of experts in the field of work with the elderly population is to create a society in which all members of the community, in accordance with their capabilities, would contribute to social development. The role of social workers and occupational therapists is therefore particularly important because they are persons (professionals) with whom the care user continually meets and cooperates. They familiarize the care user with the lifestyle in the institution and accompany him/her during his/her life in the institution, but also when leaving the institution. The social worker assumes the role of a mediator, that is, the social worker adjusts the needs and requirements of the care users, family and institution (Štambuk, Sučić, Mali, 2010).

The occupational therapist is involved in the aspect of assessing the needs and ways of performing the task and assessing the care user's living space and determining ways which can be better adapted to the care for the user's needs (Sadiković, Muftić, Bećirević, 2006; Švraka, Avdić, Hasanbegović-Anić, 2012). The methods used in the paper are based on a holistic and client-centered approach (Townsend, 1997).

On the other hand, the social work methods used in working with the elderly are generally traditional methods. The first commonly used method is *social work with the individual*, which involves working according to the needs and desires of care users, in order to monitor care users and solve their individual problems. It may include talking to care users or a family member to get to know the care users and the problems they encounter during their accommodation, to resolve the care users' personal problems, as well as conflicting situations they find themselves in. As stated in the professional literature (Dervišbegović, 2001), social work is not exhausted by providing individual assistance to the client. Providing individual assistance is just one method of solving many people's problems when they are not able to solve them themselves. Because of this, *group social work* is increasingly emerging as an irreplaceable method of working with groups where individuals live. Group work with care users includes work with larger or smaller groups of care users in order to improve and maintain correct interpersonal relationships among them. Finally, the third traditional method of social work used in working with third-age persons is *community work*. This method covers activities related to the implementation of specific campaigns on opportunities, abilities and services for the elderly in local communities. These activities aim to inform the public about the achievements of the elderly or the services offered to the elderly. In practice, a combination of these methods is advocated, which should contribute to the greater social inclusion of third-age persons, that is, to help the person accommodated in the institution to become acquainted with the new environment, to follow the course of adaptation, to assist him/her in solving

conflicts and other crisis situations. Following the above, social work in institutions can be classified into professional social work with care users, providing assistance to care users through individual and group work with the aim of providing social and emotional support and safety to care users, keeping records and documentation related to beneficiaries. The areas of duty of social workers that represent fields of overlap with occupational therapist's work is the organization of occupational, cultural, entertaining and recreational activities of the care users. In institutions for permanent accommodation of the elderly, social workers are also engaged in the activities of admission that include work on drafting contracts, opening personal files and personal records of care users, registration in institution register, regulation of pensions, disability benefits, health care, identity cards and other documentation depending on the individual need of the care user. Social workers are also involved in: monitoring the health of the care users and other changes they are facing as well as changes in the price of services; monitoring of billing of services; working with clients; drafting correspondence and information regarding care users; making official notes when depositing and taking over cash at the box office; attending the distribution of money, taking over and depositing pensions, disability benefits and other funds to care users; organization of leisure time, or organization of occupational and recreational activities of care users. A special segment of work of social workers, as well as occupational therapists, with seniors in institutions, relates to work with demented care users (work with balloons and balls to activate psychomotor functions, work with educational dice, puzzles, memo cards, with the aim of improving cognitive processes and motor skills). There is also work on keeping all records related to the provision of services in institutional and non-institutional forms of protection, as well as the tasks and activities that need to be carried out after the death of the care user (making a death certificate, registering the death register, contacts with family, registrars); as well as work after the termination of the contract for the use of accommodation services in the institution.

Based on the above mentioned, is not difficult to see the seriousness of the objectives and work that are placed before the social workers, working in the institutions for accommodation of the elderly. It is particularly important to emphasize that social workers and occupational therapists in institutions are not only limited to work within the institution - they also develop a collaborative relationship with the wider community, which is the only way to achieve at least minimal openness of institutions to the life in the communities in which they are located.

### **Traditional vs modern models of elderly care**

In the scientific literature, two traditional models of social and health care of the elderly are most often mentioned. The first model is an *open model* that defines the protection of third-age persons in their own home, which consists of a series of services that seek to preserve the independence and good psychophysical fitness of the elderly for as long as possible in order for them to remain independent for as long as possible. The main forms of this model of elderly care are: home services (housekeeping, food preparation, laundry, etc.), home delivery service, home care service, day care facility, entertainment, recreation and clubs for the elderly as a gathering place for fun, socializing, events, celebrations and the like. This model of elderly care also includes organized holidays for third-age persons with special care in the place of residence. It also includes an information service for informing the elderly about their rights, opportunities and best ways to use the service, as well as home medical care in cooperation with home care services, and senior support centers that provide courses that are useful for healthy living and for solving other specific problems of the elderly. The second model, *the closed model of elderly care*, is implemented in special institutions for the elderly in which they are permanently or temporarily accommodated. The basic network of this kind of institutions includes:

-Homes for elderly providing permanent

accommodation, nutrition, recreational activities, occupational activities and other activities.

- In addition to the above services, the gerontology center also provides home help services, day care and socializing. More specifically, gerontology centers are institutions that provide non-institutional care for the elderly in addition to institutional.

-Social-medical institutions for the care of third-age persons with severe psychophysical disabilities.

- Geriatric hospitals or wards in general hospitals are intended for the treatment of various diseases of the elderly. According to the standards of contemporary gerontology, which studies the legality of the aging process and problems related to the third age period, it is necessary to incorporate the approaches contained in the above traditional models of elderly care into one so-called "new" model that would give the elderly the care they need, according to their vitality and ability to perform daily activities. The primary objective of such a new approach to working with the elderly should be to improve the quality of life of third-age persons, regardless of whether they live in a rural or urban environment. In fact, models of care for the elderly should be designed to follow the trends of modern life. In the context of the elderly, social services include all social-protection rights such as: material security, allowance for care and assistance of another person, assistance at home, day care, placement with another family or social welfare institution.

In the creation and implementation of social services in modern societies, the key fact is that they should correspond to the level of development of a particular state, because the quality of all social services, and therefore those provided to the elderly, is influenced by the economic, socio-cultural and historical development of a certain society.

The logical question here is how to develop a cost-effective and quality system of services for an increasing number of the elderly?

In searching for appropriate guidelines for finding the right answer, it is important to note that the increasing number of older people in the total human population brings certain obstacles, such as a lack of financial resources to achieve better quality services for the elderly.

In this regard, professional literature (Havelka; Despot Lucanin, Lucanin, 2000) already points out that in the advancement of even basic models of protection of the elderly, a particular obstacle, which emerges as a constant of any social policy, is the permanent lack of funds. So, it seems right to point out that it is illusory to expect that, even through the continued economic and social development of the society, the disparity between the needs of the elderly and the ability to fulfill those needs will diminish. On the contrary, the opposite is more likely to happen. However, despite many obstacles, it is necessary to point out possible directions of development that should primarily contribute to the advancement of the quality of life and well-being of third-age persons. This is imposed as an imperative, primarily because social actors have a responsibility and duty to enable persons dignified life in the third age period, especially due to the fact that they are the persons who have borne the burden of the society development during their working life. So, for existing care services to be effective, it is necessary to know how people's needs change with aging. Numerous studies conducted in the Balkans have shown a fairly similar picture of the position of the elderly. It is also well known that more than 80% of those older than 65 suffer from a chronic illness, but fortunately there are very few severe illnesses. About a quarter of the elderly are restricted in their daily activities, while about 15% of the elderly are not able to perform the most important daily activities independently. This means that about 85% of the elderly are completely or mostly independent in their daily lives. About 6% of people over 65 and about 20% of people over 80 suffer from an organic mental illness. This means that in the elderly group, the majority of them have preserved mental abilities and mental health (Haverka, Despot Lucanin, Lucanin, 2000, according to: Schaie & Willis, 1991; Perimutter & Hall, 1992; Cox, 1993; Hayslip & Panek, 1993; Hansen Lemme, 1995). It can be concluded that for the elderly housing/accommodation as a concept is much more than an elementary possession of a "roof over the head", that is, a certain residential area

(Koružnjak, 2003). For the elderly, it is a place of meeting other people, exchanging material and spiritual goods, accepting the rules of behavior within a certain group, forming their own "small world" etc. (Ajduković, 1995). It follows from the reasoning that age adjustment depends not only on biological and psychological factors but also on external ones, such as social environment, family circumstances, housing/accommodation conditions and support systems that exist in an environment and are aimed at assisting the elderly (Žganec, Rusac, Laklija: 2008, according to Bouillet, 2003).

Therefore, it can be stated that housing/accommodation for the elderly does not only imply subsistence, but also everything that is incorporated into social inclusion, that is, the realization of social, economic and cultural rights (UNDP, 2007). Because of this, different types of housing/accommodation have been developed in the world. Given the level of dependency, there are numerous different types of residential care institutions for the elderly in the US. All types are classified into those with:

Low level of dependency (single-family housing/accommodation), accommodation / apartments with additional activities / hobby, recreation etc. / (accessory apartments), small flats in basements of existing houses (granny flats),

Medium-low level of dependency (multistory/ multiunit building assemblies within an urban area, settlement or small town, so-called elderly housing - multiunit, group homes, senior centers),

Medium level of dependency includes the widest range of housing/accommodation:

- Separated flats (domiciliary care facilities, board and care, personal care homes, independent congregate housing-retirement hotels)

- Nursing homes, the so-called homes for the aged

- Resorts or spas (rest homes)

- Health-related facilities

- Nursing homes for the elderly (seniors in last stages of illness), with the accommodation for their family members (hospices),

Medium-high level of dependency includes accommodation in nursing homes with various levels



of care or clinics with ongoing and permanent care (continuing care retirement community) and

5. High levels of dependency that include polyclinic and intensive hospital monitoring (rehabilitation, acute-care hospitals) (Koružnjak, 2003).

European examples (Western Europe) also have different levels and models of care for the elderly and infirm. All of them, like the American, are also divided according to the needs and capabilities of third age person (Koružnjak, 2003, according to: Valins, 1988).

From the above mentioned, it follows that all models and services in the field of social protection should complement and meet the needs of third-age persons according to the principle of “least restrictive alternative”. This principle implies that government interventions and / or services provided should be consistent with the capabilities and abilities of the individual to take care of him/herself. A prerequisite for achieving all of the above is the establishment of a quality network of interprofessional social and health care.

### **Social exclusion of the elderly in Bosnia and Herzegovina and Serbia**

Continuous changes in the society, continually place new demands on individuals and groups, producing different positive or negative states in which these same individuals and groups may find themselves. In cases where social change leads to the creation of certain negative states for individuals or groups, then the term “socially excluded” is used for them, and the condition is referred to as “social exclusion”. In Bosnia and Herzegovina, as well as neighboring Serbia, the elderly population is often considered highly vulnerable by different criteria. This is a group of people who are often marginalized in terms of their social influence, they are economically weaker than young people. They are also in stages of health risks, etc. All of this contributes to the weakening of the relationship between them and society, which makes them socially excluded members of the community. As it is pointed out in the professional literature (Žganec N., Rusac S., Laklija M., 2008), the key problem of the elderly

is related to their social exclusion. The phenomenon of social exclusion of the elderly most often includes: the dimension of social relations that is usually weaker than in working and mature age, participation in cultural activities, access to services in the local community, exclusion from the neighborhood, access to redistribution of financial and other material goods (Walker and et al., 2006). The same authors (Žganec N., Rusac S., Laklija M., according to Walker et al., 2006) point out that the generation of baby boomers (people born between 1945 and 1965) is less attached to their community than earlier generations, and are therefore at greater risk of becoming socially excluded. Their social network is poorer in quality and quantity, so social contacts are superficial and they show less interest and need for belonging to the neighborhood.

All these problems are particularly present in the countries of the Western Balkans (Serbia, Bosnia and Herzegovina, Montenegro, Northern Macedonia, and Albania). It should be noted here that few measures are implemented in Bosnia and Herzegovina aimed at real involvement of the most marginalized groups. Within the set of social care institutions dealing with the provision of services and care for the elderly in Bosnia and Herzegovina, centers for social work are particularly distinguished. That is kind of institution which in addition to coordinated activities with a network of institutions at the level of the local community, especially in the field of health care and other governmental and non-governmental organizations sectors, also have specific statutory obligations to implement social protection measures for this group of the socially excluded. The entity laws (Law on the Basics of Social Protection, Protection of Civilian Victims of War and Protection of Families with Children of the Federation of Bosnia and Herzegovina, Article 12; the Law on Social Protection of Republika Srpska, Article 10; and the Law on Social Protection of District Brčko, Article 18) recognize the elderly without family care as a specific category of social care beneficiaries (persons over 65 (male) or 60 (female), who do not have family members or relatives who are legally required to support them, or that those family members are unable to fulfill the obligation of support).



The law also stipulates that the elderly as well as other beneficiaries of social care (persons with disabilities and persons with physical and mental disabilities, financially uninsured and incapacitated persons, persons with socially negative behavior, persons and families in need of social care due to special circumstances) can exercise the following rights through Care Centers: the right for financial assistance, accommodation in other homes (elderly people who are unable to take care of themselves, and due to housing/accommodation and family circumstances are not able to afford protection in another way), placement/accommodation in a social care institution, home care and home assistance and professional work services. The exercise of the aforementioned rights in the territory of Bosnia and Herzegovina is conditioned by the material capacities of the entities and the Brčko District and this is an example of a violation of basic human rights - the right of equal social security and social protection. This is compounded by the fact that certain legal solutions that are in the best interest of the elderly population (e.g. placement/accommodation in another home) are almost never put into practice. It can be concluded that the programs for the elderly in Bosnia and Herzegovina are incomplete and uncoordinated, which is reflected in the overall quality and well-being of this population.

Concerning the position of the elderly in Serbia, available data (Babović, et al., 2018) indicate that their position is relatively unfavorable and that they face numerous problems in achieving satisfactory living conditions. So, compared to the situation in EU countries, the elderly in Serbia live shorter and with poor quality of life. The most important document that prescribes services and care for the elderly in Serbia is the Law on Social Care / Protection. In addition to the mentioned law, the rights of the elderly population of the Republic of Serbia are regulated directly or indirectly by many other laws such as: Law on Pension and Disability; Law on Compulsory Social Security Contributions; Labor law; Law on Social Housing / Accommodation and Law on Health

Insurance. Speaking of social services prescribed by the Law on Social Care / Protection of Serbia, these services mainly include accommodation services, day care and home help. According to Article 41 of this Law, an individual over the age of 65 may be a beneficiary of social care/protection services if his/her safety, well-being and productivity are endangered due to age, illness, disability or similar risks. It is interesting to note that the number of licensed nursing homes for social care and accommodation in Serbia is increasing. According to the reports of the Institute for Social Care / Protection at the Work of Private and Public Institutions for Accommodation (Republican Institute for Social Care / Protection, 2017a, 2017b) in 2016, there were 160 such institutions, of which 119 were private and 41 were public. In early 2018, the total number of active licensed nursing homes for social care and accommodation was over 190. The trend of the construction of private nursing homes for the elderly is also present in Bosnia and Herzegovina. A special problem in Bosnia and Herzegovina is the fact that there are no specified standards for the establishment of such institutions. In future that can be a reason of why their uncontrolled increase could emerge. Even flats and abandoned houses are being used for this purpose (<https://www.blic.rs/vesti/republika-srpska/privatni-staracki-domovi-van-kontrole/qn0y3el>). All of the above indicates that key social actors, both in Bosnia and Herzegovina and in Serbia, are doing little to realize activities that should contribute to a better quality of life and well-being for the elderly.

So, in the future, much more effort is needed to create the environment in which third-age persons would have quality access to key resources that enable them to achieve adequate involvement in various aspects of social life, as well as meet economic, social and cultural needs. It is crucial to point out that in addition to housing/accommodation, which defines the elementary living conditions, access to new communication technologies, especially IT, is important for the elderly. This is important for the elderly because the lack of information in this segment makes the elderly even more excluded.

The reason for this lies in the rapid technical and technological development when access to information, funds or administrative services (issuance of personal documents, permits, regulation of tax obligations, etc.) is often achieved through various information and electronic portals and applications. This lack of information about these changes certainly contributes to the growing gap between society and elderly. Access to public transportation is also important, because it provides the spatial mobility necessary for an active life and connection with others in the community, regardless of whether the person is housed/accommodated in his/her own house or institution. Some authors have pointed out (Babovići et al., 2018) that this aspect has not been given adequate attention from the researchers to date.

## CONCLUSION

Despite the continued emphasis on the problem, but also the need to create measures and policies aimed at improving the quality of life and well-being of the third-age population, it is more than obvious that these individuals are lonelier and excluded from the communities in which they live. This trend is especially dominant in the first decades of the 21st century. In order to overcome the negative trend of population aging, it is important to develop new and high-quality approaches to social services as key resources needed to provide better health and social care in the third-age life period. It is also necessary to focus on creating support networks for the elderly and to focus on enhancing the closed model of protection and care for this population. The objective of all forms of support and assistance should be aimed at creating an environment in which the elderly should not be seen as passive beneficiaries of services but as a social resource that needs to be activated and channeled into opportunities and potentials, and also motivated to contribute to community development. Certainly, the professions of social worker and occupational therapist play an increasingly important role in achieving this goal. The specificity of professional work with the

elderly is especially evident in the institutions for the elderly. Some authors (Milosavljević, 1995) point out that the first objective of social work in institutions is discovering and stimulating the optimal life potentials of every social care institution beneficiary. The second objective that the same author points out is an effort to create optimal living conditions in the care institution to the general satisfaction of all beneficiaries. The third objective is helping the elderly to overcome the difficulties of life conditioned by living in the social care institution.

Occupational therapy, which includes meaningful activities that people engage in during their lives and which in the context of the elderly should contribute to the preservation of the existing, but also to the acquisition of additional vitality, also has an important place in modern care institutions for the elderly. It is important for the care institutions to classify daily activities into three groups: productivity, self-care, and leisure (Ristic, 2018). In the opinion of the same author, occupation should cover all aspects of the active process of living, which is especially important for persons after the age of 60 and 65, when the relationship between the individual and social roles drastically weakens. Following on from the above, the aim of social workers, as well as other professionals, through interprofessional collaborative work in practice, should be to improve the quality of life and well-being of third-age persons in care institutions and beyond. The above mentioned is particularly important because the social status of that group is not a personal problem for themselves (the elderly). It can be concluded that this is a serious social, legal and cultural problem that requires the involvement of many social actors.

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## WHICH VARIETIES OF ARABIC TO LEARN?

Review article

Andjelka Mitrovic<sup>1</sup>

<sup>1</sup>*Department of Oriental Studies, Faculty of Philology, University of Belgrade, Serbia.*

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### ABSTRACT

*Teaching Arabic as a foreign language is very specific for different reasons. The main obstacle in searching for the optimal and effective teaching model for the Arabic language is the pronounced diglossia, a situation in which two languages or two forms of a language are used simultaneously under different conditions, formal and functional in a community, that is to say “higher” literary/standard Arabic and a “lower one” which encompasses numerous regional dialects. As a foreign language, Arabic has been taught all over the world, primarily at the university level, but the priority has always been given to a “higher language”. It is also dominant in teaching nowadays but in creating curricula for teaching Arabic, more attention has been paid to relating the opposites of diglossia with the main speech dialects.*

**Key words:** *Arabic, diglossia, standard Arabic, speech dialect, teaching models, methodology*

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<sup>1</sup> **Correspondence to:**

Andjelka Mitrović, Ph.D., Department of Oriental Studies, Faculty of Philology, University of Belgrade, Serbia  
Studentski trg 3, Beograd, Serbia  
E-mail: [andjelkamitrovic@yahoo.co.uk](mailto:andjelkamitrovic@yahoo.co.uk)



Arabic is the official language in dozen countries which, despite all and very often decided religious, ethnical, geopolitical, economical and other differences make one relatively homogenous speech community, situated in the area of Middle East, i.e. Northern Africa and a part of Asia. That region is abundant in contrasts, different ethnical and religious groups, different traditions and spiritual wealth, high prosperity and utmost poverty, tolerance and hate... Middle East is the cradle of ancient civilizations – Sumerian, Assyrian-Babylon, Egyptian, Phoenician, Aramaean, Judaism and others to which the debt of gratitude is to be given forever by the mankind for the inheritance of both spiritual and material culture. This is the birthplace of the three great monotheistic religions: Judaism, Christianity and Islam the announcement of which was declared in Arabic.

In economical respect, Middle East played an outstanding role particularly on the Silk Road due to the important caravan route and flow of the world trade. Then, there are numerous natural resources, first and foremost oil, the enormous capacities of which belong to some of the Arabic countries. Prosperity of the Arabic countries has been affected to a large extent by their touristic expansion, civilization contrast, historical monuments, magic of the desert as well as a lot of things that attract the visitors from all over the world.

Unfortunately, that great cradle of ancient civilizations and enormous natural resources has been a battlefield of numerous conflicts and wars as is a long lasting Arabic-Israel conflict, Iraqi War, the war and permanently smouldering crisis in Liban, Syria and Libia... In addition to this, some Arabic countries and their regimes have been mentioned nowadays as the main source, instigators and backers of the global terrorism.

Due to all this, the Arabic world has been for decades in the focus of various world economic, political, cultural and scientific streams. Therefore the importance of learning Arabic has grown in the last decades, in America and Europe particularly. A special attention has been drawn to the teaching of Arabic

and methodology at many American and European universities as well as in some other institutions (eg. military centres).

According to many factors Arabic language teaching (ALT) as a foreign language is extremely specific for different reasons: because of the distinct diglossia, different writing system and the system of notification, different linguistic structure and so on. The basic obstacle in finding optimal and effective teaching model in case of Arabic is diglossia, i.e. simultaneous use of the two functional and formally distinctly divided varieties of one language, “higher”, literary Arabic/standard Arabic language (ar. al-luġa al-fuṣṣḥa) functioning as a widely accepted written language standard, mainly unique for the whole Arabic world learned through formal education at schools, and a “lower one”, encompassing numerous regional speech dialects (ar. al-luġa al-‘āmiyya). Apart from them, “there are a lot of intermediate varieties and registers, among which an elusive, but evidently ‘transitional’ or ‘Middle Arabic’ (ar. al-arabiyya al-wusṭā) stands out spoken by educated Arabs from remote parts of Arabic world, and which represents a specific functional mixture of a standard variety, ‘general dialectisms’ and the two speech varieties in contact.

Diglossia is a phenomenon of a society wide order so that the linguistic ability (competence and performance) of on average educated Arabs, naturally implies knowledge of both of its contrasting poles at which the knowledge of a “higher” variety (particularly performance) to a larger extent depends on the level of education (Tanasković, 1980, p. 64).

Diglossia is a universal linguistic phenomenon and is present, more or less, in all languages of the world. As far as Arabic is concerned the linguistic disunion is very pronounced and stable and nowadays all over the world it represents the language with the most outstanding diglossia.

At the beginning of early 1960’s Arabic diglossia became the topic of the important and extensive linguistic, primarily sociolinguistic interests.

Simultaneous use of the two or three formally and functionally distinctly separated varieties of the Arabic language within large Arabic speaking community has been envisaged in a qualitatively new way, first and foremost in the learning and description of various language idioms in specific parts of the Arabic world as well as in the organization of language use.<sup>2</sup>

Modern literary Arabic/Modern Standard Arabic, a descendant of the classical Arabic, although often defined as worldwide written language standard, is not completely unified for the fact that influence of the local dialects in different Arabic countries can be felt in it. It is the language of media, science, literature, the language of Inter Arabic communication, the language of spiritual and cultural inheritance of the Arabic-Islamic civilization and above all the language of Islam and *Qur'an*.

The speech dialects of Arabic have been existing for long in Arabic speech community, in fact, since the time bygone (Janković, 1978, p. 152). Various Arabic tribes on Arabic Peninsula spoke them several centuries before Christ and their features stood the test of time through

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<sup>2</sup> Diglossia has become in the Arabic world a subject of interest of numerous arabists-linguists, particularly since the moment of great development of sociolinguistic research. Great contribution to the description of the wholesome speech community of Arabic, as well as of its particular parts was given by: S. J. Altoma (*The Problems of Diglossia in Arabic*, Cambridge-Massachusetts, 1969), A. F. Beeston (*The Arabic Language Today*, London, 1970), W. Diem (*Hocharabisch und Dialekt im Arabischen: Untersuchungen zur heutige arabischen Zweisprachigkeit*, Wiesbaden, 1974), Ch. Ferguson („Diglossija“ / *Word*, 15, 1959, p.325-340; *Myths about Arabic / Readings in Sociology of Language*, ed. J. Fishmann, London, 1970, p. 375-381), R. S. Harrell (*The Phonology of Colloquial Egyptian Arabic*, New York, 1957), T. F. Mitchell (*Colloquial Arabic: The Living Language of Egypt*, London, 1962), V. Monteil (*L'Arabe moderne*, Paris, 1960), R. Nakhla, „L'Arabe classique et les dialectes néo-arabes“ / *ETI*, I, 1938, p. 15-25, II, p. 148-168), N. Tomiche („Les Parlers arabes d'Egypte“ / *Études d'orientalisme dédiées à la mémoire de Lévi-Provençal*, T. II, 1962, p. 767-779; *Les Parlers arabe du Caire*, Paris, 1964). Srđan Janković, arabist-linguist from Sarajevo for decades has systematically studied this topic and wrote many important studies: „Diglosija – sociolingvistički fenomen suvremenog arapskog“ / *Radio Sarajevo – Treći program*, 20, 1978, 142-177, „Polovi diglosije u arapskom“ / *Prilozi za orijentalnu filologiju*, 14, 1975, 283-300 i *Diglosija u savremenom arapskom: Na materijalima književnog arapskog i egipatskog kolokvijalnog arapskog* (Doktorska teza, Sarajevo, 1975).

centuries becoming rich and naturally developing under the influence of different social factors. On the basis of a large number of spoken dialects a unique language model was created – *coine* having the most outstanding features of the spoken language. Nowadays the spoken dialects are the essential and active factor in the Arabic reality. Dialects vary from country to country, moreover from region to region within one country. Within it colloquial speech of a city differs from that of the village, nomadic from the one of the inhabitants in settlements, the spoken language of different social classes and groups, ethnic and religious communities... The differences between literary Arabic and Egyptian dialect exist on all linguistic levels. On phonetic-phonological level: some sounds have different pronunciation and the vowels “e” and “o” come into view as well. On morphological level the changes have been shown in the change of some verbal and nominal paradigms, in gender and number, then with imperfect and perfect conjugation, as well as with the complex tenses, in the distribution of auxiliaries, in the pronoun system, in a system of cardinal numbers, with the adjectives and in the use of the relative case. As far as syntax is concerned, changes are perceptible in the organization of a simple and complex sentence. The differences are prominent on the lexical level.

A dialect is, in fact, a mother tongue of every Arab. This is the language of every day communication. The mass media in Arabic countries instead of fighting for the correct literary language, use the dialects to great extent in different broadcasts so that the spoken idioms are frequently present in radio and television programmes.

Although the Arabic writers introduce significantly the dialects into literature at the beginning of 20<sup>th</sup> century, we come across their traces in classic Arabic literature in the writings of such linguistic and literature authorities as were for example Jahiz (Ġāhiz, 768-869), or in poetry (i.e. *muwaššaʿ*, *zağall*). This variety is nowadays, due to its connection with everyday life, nearly unavoidable in the dialogues in stories, novelettes and novels because of the simple constructions, expressiveness but also because of the ability to render various thoughts and most subtle feelings.

The presence of speech variety is even more outstanding in drama creativity. The plays have been woven only from dialogues through which life has been reproduced in a specific way and the personality traits of the characters have been revealed.

Therefore, for the plays with the topics from everyday life the dialects are the only natural and adequate way of describing characters. In such a complex linguistic situation the arabists of all generations used to ask a question: “Which Varieties of Arabic to learn? The answer to that seems to be everlasting question in Arabic studies, easy not in the least, especially lately. In the field of methodology no method, comprehensive and effective, has been discovered so far that would enable the acquisition and development of practically double linguistic competence as well as the adequate communicative competence. This does not mean that there were no such attempts and advances. Arabic has been taught all over the world at the university level and advance was always given to a “higher” variety, i.e. to the literary language – classical or contemporary respectively. Grammar-translation method was in that case an adequate approach as it enabled solid knowledge of grammatical structure, and above all, of strictly formalized morphology of Arabic characterized by a multitude of paradigms for derivation of various linguistic forms, within which there is a great degree of regularity and systematic phenomena in language. Morphology is, in effect, the basic condition and a key to the acquisition of receptive knowledge (comprehension and reading of the written language), taking into account that this is the Arabic script of consonant type implying only the marking of consonants but of vowels only sporadically

It was only at the end of 19<sup>th</sup> century that the first university courses of Arabic speech dialects were established. The National school for alive oriental languages (Ecole nationale des langues orientales vivantes) in Paris was one of the first universities in Europe and the World where the courses of eastern and western Arabic dialects were introduced in 1821.

Traditional teaching practice<sup>3</sup> lasting for centuries which was focused on literary Arabic and grammar-translation method and which enabled the students to acquire the linguistic competence, primarily, morphological necessary for the development of both receptive and productive language skills at the end of 20<sup>th</sup> century began to modernize with regard to the demands of modern era and modern societies, in which globalization, great expansion of communicative and informational technologies as well as the need for functional education and concrete knowledge have become dominant. In new educational models, a special attention has been paid to fluency in foreign languages (Šotra, 2006) and that is the consequence of different reasons, primarily economical, as nowadays in the modern world and at the markets of the world – and Arabic market is particularly huge and has an outstanding status and importance – no business is possible without such knowledge.

Nowdays it is still Classical Arabic that is dominant in teaching, but in the course of the last three decades the teaching process and methods have been essentially modernized to meet various communicative needs and encourage acquisition of active knowledge that every teaching primarily aims at, above all in the sphere of written production. Therefore modern textbooks were issued which besides obligatory textual component included various drills designed to help learners acquire vocabulary, grammatical categories and rules more efficiently and the elements of conversation as well.

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<sup>3</sup> The first centres for Arabic language teaching have been established in Spain, France and Netherlands since 11th century and used for instructing catholic missionaries and preachers. Missionaries also deserved the merit for founding the first Arabic department. Namely, a missionary Guilanme de Postell (1510-1581) on his return from Orient and cessation of the missionary service, established the first university Arabic department in Paris in 1539. at French college (Collège de France). At the end of 16th century a famous Leiden department was founded and in 1632. the Arabic department was established in Oxford, and since then many others were established all over Europe, primarily from religious reasons and then from economical. More about that in: cf.: M. Rodinson, “The Western Image and Western Studies of Islam” / *The Legacy of Islam*. Ed. by: J. Schacht, Oxford, 1974, p. 9-62.

The Arabs themselves tend to contribute to the modernization of teaching Arabic as a foreign language. There are several renowned institutions in Arabic world which organize courses with different levels for the foreigners while at it appreciating modern achievements in methodology enabling acquisition of both receptive and productive knowledge. Among them the Institute "Burgiba" in Tunisia surely stands out (Quasi, 1998). Standard Arabic is an excellent base for acquiring various spoken dialects as well as "the third" language used by educated Arabs in their communication, particularly with foreigners. In the last ten years while designing teaching models for Arabic, more attention has been paid to connecting poles of diglossia and also to the main speech dialects. But, due to the extremely complex sociolinguistic reality of the different speech community of Arabic, populous and specific in all respects, occupying vast territory on one hand and the new trends in language teaching on the other, it proves to be sophisticated and responsible task as the unique teaching method that would successfully solve all the problems in non-native reality and ensure uniform acquisition and development of total linguistic competences does not exist.

In the absence of ideal teaching method, the attitude of modern methodology is a practical one, having in mind that there are more paths to reach the aim of realizing teaching the language.

Therefore it is often necessary "to introduce an eclectic approach, which contains various elements of different methods chosen to meet the needs of specific teaching situations" (Kristal, 1995, p. 374).

Decidedly eclectic approach is actual nowadays in the methodology of teaching Arabic as a foreign language which has only lately been more seriously defined in Europe and America since the focus is being transferred from linguistic structures and grammatical rules to the speech production and communication by introducing modern methods used in the teaching of other modern foreign languages (Scrivener, 2005; Richards & Renandya, 2002; Scott, 2001; Nunan, 1998). It is clearly seen from the curricula of some of the European departments and particularly in the new textbooks in

which together with functional textual components and different drills for acquisition and development of lexical components the elements of conversation were introduced. "As a general ideal aim of every foreign language teaching is acquiring of competence native-speaker like or approaching that type of competence at least, it could be expected that the system of teaching Arabic makes such achievement of the described diglossic complex linguistic ability, possible" (Tanasković, 1980, p. 64). In a case of Arabic such competence is available to some extent only by introducing speech dialects. Our studies on Orient have always tended to keep pace with the world mainstream Oriental and Arabic flows as well as with those at home in order to fit in numerous reform processes and the needs of society. At this time we are active participants and witnesses to one more school reform in Serbia but also in Europe. Owing to the insight into the syllabuses of the relevant Arabic departments, the Arabic language teaching at the Oriental department of the Faculty of Philology in Belgrade has become updated and modernized by introducing new subjects/courses as well as the new methodology in teaching the language. Since 2006/2007th, the students at the Section for Arabic language, literature and culture have been studying following the new radically changed plans and syllabuses. In terms of this, so far exclusively philologically structured syllabuses have been enriched with cultural-civilization dimension, that is with numerous subjects dealing with Arabic-Islamic culture and civilization. In addition to all that, linguo-cultural approach has been pointed out so that it will surely contribute to the corresponding development of overall linguistic competences of the students and their general sociolinguistic competence. From now on students will, owing to carefully chosen and graded pedagogical material, successfully develop specific linguistic levels acquiring grammatical units and lexis and developing and improving both spoken and written production in Arabic. At the same time systematically and thoroughly students will get to know all segments of Arab speaking community which is for the majority of students completely new and unknown field, i.e. they acquire all the necessary knowledge and information about



geography, history, culture, art, philosophy, religious system/systems, geoeconomy, economy system of values in Arabic world, school system, law, ways of living, folklore, beliefs of the people, gastronomy... (Mitrović, 2009, 2008, 2006, 1997). In such teaching, courses of the Arabic dialects as Egyptian, Iraqi, Syrian, Maghrebi Arabic, which are optional subjects, are ranked high and have become very popular among the students. These two-term courses enable the students to get to know phonetic-phonological, morphological and syntactical features of the main Arabic dialects as well as to acquire lexis and phrases intended for everyday communication. So far rather scanty bibliography of the textbooks and dictionary literature for Arabic dialects have been increased lately and our contribution to that list is the textbook for Egyptian dialect *Ekalem Masri I* (Beograd, 2011), written by Iman Jarić, a lecturer for Arabic at the Oriental department at the Faculty of Philology in Belgrade. This manual consisting of 15 lessons in which the different topics and vocabulary have been presented through conversational context and life and situationally based contexts is useful and unavoidable companion for anyone who wants to learn the Egyptian dialect and to reveal its misteries. In order to develop communicative competence of the students of Arabic, as well as their overall linguistic competence, it is necessary to creatively develop all the courses permanently and to improve them in quality with the topics and materials. It should be particularly pointed out that at the Belgrade department there are excellent conditions concerning lecturers – lecturers from different important parts of the Arab world. As late as next year the students will have been able to learn new dialects – Libyan and Palestinian, and a decade old teaching experience has shown that there is place for four-term teaching of Arab dialects, a constitutional part of which will be the use of dialects in literature.

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