



THE SIGNIFICANCE OF ORIENTATION OF BLIND PUPILS TO THEIR BODY IN REGARD TO MOBILITY AND SPACE ORIENTATION

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ABSTRACT

Independent and safe movement includes the development of motor skills, the acquisition of basic concepts, the awareness of oneself and the awareness of the environment. The aim of the research was to determine the influence and significance of the orientation to the body of blind students, on orientation and mobility. The sample consisted of 30 blind students aged 7 to 15, placed in the internal accommodation of the Center for Children and Youth with Developmental Disabilities "Budućnost" in Derventa and the Center for Blind and Visually Impaired Children and Youth in Sarajevo. The research used an instrument for assessing the ability of the mobility of the blind, which established the initial and final levels of development of the ability to orientate towards one's own body and the mobility of blind students. For statistical data processing, descriptive statistics and t-test methods were used. The results are in favor of the final measurement, that is, after the treatment was carried out, the improvement of the orientation towards the body was determined, which influenced the orientation and mobility of the blind pupils.

Keywords: *blind pupil, orientation towards one's own body, movement*

INTRODUCTION

Blind students face daily problems with routine activities and problems in orientation and movement. No matter how a blind student or person is trained on some activities, they always encounter new temptations and unknown situations. Therefore, working with blind people should be planned, programmed and continuous. Some authors point out that one of the specifics in working with a blind child, the fact that such a child, due to the tendency of passivity, must always be en-

couraged to activity (Zrlić, 2008, according to Sekulić-Majurec, 1988). Movement is a fundamental learning block. As a child explores his world and has physical contact with it, learning takes place. Children with visual impairment usually need encouragement to explore their own body and their environment. For them, the world can be a startling and unpredictable place or it can be very non-motivational. Vučinić (2014) points out that children with visual impairment face the limitations of acquiring knowledge and skills because they are not visually motivated to explore space.

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Among the consequences of blindness, especially difficult are the ones in the area of orientation and mobility in the space, which make the blind person independent to the visible population. Therefore, programmed exercises try to mitigate the consequences, with naturally precisely defined techniques of individual work (Teskeredžić et al., 2012). One of the most important, if not the most significant factor of the independence of persons with visual impairments, is the successful self-movement, both in the known and in the unknown area (Nenadić, 1999). In an unknown place, a blind person can not move on his own, nor orient without a companion (even with a stick or with a dog). Anđelković (2014) points out that children with visual impairment are often at risk of being socially isolated. Orientation and movement is one of the important specific rehabilitation programs created for people with visual impairment (Fajdetić, 2012, according to De l'Aune, 2006, Bussen, 1992, Giffin-Shirley et al., 2006, Welsh, 2006). This is the process of establishing a unique attitude and relation to important objects in one environment. For a blind person, the ability to perceive her/himself and her/his environment is the result of concentration and practice during the training period. Orientation is the ability to understand the environment through spatial orientation and understanding spatial relationships between objects and people around (Kuduzović, 2013, according to Best, 1995). The importance of spatial orientation and the independent movement of the blind person is not only in the management of the culture of the movement, but it is a basic condition for the independent life of the blind and visually impaired, their integration into the society, the process of work and the life of the society as a whole (Češarak, 2015, according to Wiener, 1995). Independent and safe movement includes the development of motor skills, the acquisition of basic concepts, the awareness of oneself and the awareness of the environment. The ability to move independently is an integral aspect of each individual, educational and social development of one person. Effective use of appropriate techniques allows pupils with visual impairments to participate, as much as possible, in their activities alone and / or individually (Briggs, 1999). Early childhood orientation and movement mean helping a blind and visually impaired child to become independent of movement, research, use of senses and practical infor-

mation about his world (Cesarek, 2014, according to Simmons and O'Mara, 1992). Orientation and mobility must begin with basic steps, through good knowledge of one's own body (Cesarek, 2014). More authors (Cesarek, 2014, by Anthony et al., 2002; Dodson - Burk and Rosen, 2002; Hill, Rosen Correa and Langley, 1984, by Anthony, Hatton and Stewart, 2008; Eichfield, 2011; Shiltz, 1997; Filan, 1998; Bishop, 1996; Wiener, Welsh, Blash 2010; Anthony, 2014) show that to gain orientation and mobility for a child, important skills are to acquire: sensory skills, concept development, development of motor skills, monitoring, using protective skills and using them before the stick. Today, there is relatively little knowledge of these abilities, and in our pedagogical and psychological, as well as defectological literature, very little or almost no writing is written, and at first glance it seems that they are not particularly important in the process of learning and developing a child (Zovko, Oberman-Babić, 1994). Psychomotor abilities refer to concepts or knowledge of the own body, its keeping and walking, then on coordination in the movement of sensory ability, and other psychomotor traits. In connection with the body structure, Frostig (1970) lists three of his components: the body pattern, the concept of the body and the appearance of the body. The scheme of the body includes the body structure and its parts, and their position in general at a certain time. Awareness of the material of the own body is always present, although a blind person often is not aware of it. The concept of the body refers to the understanding of the body, that is, its structure and the names of their parts, and their interrelations. Body appearance includes individual emotional reactions to one's own body (Zovko, 1994). Independence in orientation and movement is a very important factor in the independence of people with visual impairment. In order to achieve this step, it is necessary to develop and improve orientation, on the own body, and individual treatments in orientation and movement in the micro and macro environment. The aim of this paper was to examine the orientation towards one's own body of blind students if one of the factors influencing independence in orientation and movement. Because of the complexity of early development and the development of perceptual abilities, the process of orientation and movement in the early years differs from the older chronological age.

Therefore, it is important to assess the perceptual abilities of blind students as soon as possible. In training for orientation and self-movement, an individual approach is indispensable, since the two subjects on the stimulus and movement, which are not even developed, do not react successfully and equally quickly. It is very important to do an initial assessment of the perceptual abilities of a blind student, at an earlier age, in order to respond in time to help him overcome certain problems, for example, in terms of lateralization, the relation of one's body to another, the orientation of one's body, the adoption of the basic concepts (above, below, up, under etc.), all of which is a condition for successful orientation and mobility. The aim of the research was to determine the influence and significance of the orientation towards the own body of the blind pupils on orientation and mobility.

WORK METHODS

The sample consisted of 30 blind students aged 7 to 15 years old, out of which 17 male and 13 pupils of the female population, with the basic sampling kit being amourosis without any further damage. The pupils are in the internal accommodation of the Center for children and youth with developmental disabilities "Budućnost" in Derventa and the Center for blind and visually impaired children and youth in Sarajevo, of which 9 blind students are not accommodated, but come to the educational process on a daily basis. It is important to note that students of the Center for children and youth with developmental disabilities "Budućnost" of Derventa, for the first time had the testing of the remaining perceptual abilities, and that they also established their first contact with a white stick and generally with individual treatment of orientation and mobility. For data collection, data from the respondent's file was used, which consists of the basic data of the respondents. The research used the "Mobility Impact Assessment Instrument for the Blind" (Zovko, 1994), which established the initial and final levels of development of mobility capabilities of blind students. The test consists of ten subtests with a total of 67 variables, and for our research we used a subtest: Orientation to the own body. After individually determining the initial level of development of orientation towards one's own body and the ability of the mobility of blind students, an individual programmed quarterly treatment in the field of orientation and mobility was applied. Individual treatments

up to 45 minutes were done once a week with each student. Because the pupils stay in the school, (those are internatinal types of schools), the research was done after regular classes, in the student's free time. All treatments were in accordance with established safety rules and with the verbalization of the activities being conducted. Per one trial exercise is permitted, in order to gain a sense of a given task, and after that the students independently did the tasks in the initial test. In this way, initial testing was done, and on the basis of it, an individual treatment for each student was created. After the individual treatment of orientation and mobility, the same test also carried out a final assessment of the orientation and mobility capabilities. For statistical data processing, descriptive statistics were used, and a t-test for the dependent sample of the respondents was used to test the significance of the differences between the arithmetic meanings of the initial and final states.

RESULTS

The results of descriptive statistics, that is, the measures of central tendency and the dispersion measure in relation to the orientation towards their own body in the initial measurement, ie prior to the implementation of the treatment, are shown in Table 1. From the measures of central tendency, the arithmetic mean, median and modus were calculated, while the standard deviation, variance, minimum and maximum results were obtained from the dispersion measures. Also, distribution measures, ie measures of roundness and rigidity are shown. The results obtained with respect to the Body Plans variable indicate that the arithmetic mean is 11.57 ± 1.01 , the median 12, the modus 12, while the minimum and maximum results range from 9 to 12. In relation to symmetry measures, the distribution is negatively asymmetric (-2.04) and platycurtical (2.58). The arithmetic mean on the variable "Body Parts" is 42.73 ± 2.13 , median 44, modus 44, minimum and maximum results range from 37-44. The distribution is negatively asymmetrical (-1.62) and platycurtical (1.38). The arithmetic mean of the variable "Complex estimates of body reactions" is 25.37 ± 4.72 , "Understanding relations on the body of another person" 41 ± 1.60 and on the variable "Body-subject relations" is 6.97 ± 1.75 . The results in relation to symmetrical and curtical measures show that distributions on all three variables are negatively asymmetric and platycurtical.

Table 1 Measures of central tendency and dispersion measures with respect to the orientation towards the own body (initial measurement)

Variables	M	MED	MOD	SD	VAR	SIM	CUR	MIN	MAX
Body plans	11.57	12.00	12.00	1.01	1.01	-2.04	2.58	9.00	12.00
Body parts	42.73	44.00	44.00	2.13	4.55	-1.62	1.38	37.00	44.00
Complex estimates of body reactions	25.37	28.00	28.00	4.72	22.31	-1.45	.46	14.00	28.00
Understanding relations on the body of another person	41.00	42.00	42.00	1.60	2.55	-1.47	.98	37.00	42.00
Body-subject relations	6.97	8.00	8.00	1.75	3.07	-1.14	-.71	4.00	8.00

The results obtained with respect to the orientation towards the own body in the final measurement, or after the implementation of the treatment, on the "Body Plans" variable indicate that the arithmetic mean is 12, median 12, modus 12. In relation to the remaining

variables, it can be seen from the table that the values of the arithmetic meanings on all applied variables are maximal, which suggests that after the treatment was carried out, the orientation of the subject was improved on the respondent's own body (Table 2).

Table 2 Measures of central tendency and dispersion measures in relation to the own body orientation (final measurement)

Variables	M	MED	MOD	SD	VAR	SIM	CUR	MIN	MAX
Body plans	12.00	12.00	12.00	.00	.00	-	-	12.00	12.00
Body parts	44.00	44.00	44.00	.00	.00	-	-	44.00	44.00
Complex estimates of body reactions	28.00	28.00	28.00	.00	.00	-	-	28.00	28.00
Understanding relations on the body of another person	42.00	42.00	42.00	.00	.00	-	-	42.00	42.00
Body-subject relations	8.00	8.00	8.00	.00	.00	-	-	8.00	8.00

Table 3 shows the results of the t-test before and after the performed treatment. On the basis of the obtained results, it can be concluded that there is a statistically significant difference on all applied variables of the orientation towards the body. The results of the t-test show that at the level of statistical significance, .01 and .05 there is a difference between the initial and final measurements on the variables "Body parts" (t

$= -3.25$, $p = .00$), "Complex estimates of body reactions" ($t = -3.05$, $p = .00$), "Understanding relations on the body of another person" ($t = -3.43$; $p = .00$), "body-subject relations" ($t = 3.23$; $p = .00$) and "Body plans" ($t = -2.36$; $p = .03$). The results are in favor of the final measurement, that is, after the treatment has been carried out, there has been an improvement in the orientation towards one's own body.

Table 3 Results of the t-test in relation to the orientation towards the own body

Orientation	Measurement	M	SD	t	p
Body plans	Initial	11.57	1.01	-2.36	.03
	Final	12.00	.00		
Body parts	Initial	42.73	2.13	-3.25	.00
	Final	44.00	.00		
Complex estimates of body reactions	Initial	25.37	4.72	-3.05	.00
	Final	28.00	.00		
Understanding relations on the body of another person	Initial	41.00	1.60	-3.43	.00
	Final	42.00	.00		
Body-subject relations	Initial	6.97	1.75	-3.23	.00
	Final	8.00	.00		

DISCUSSION

Generally speaking, for the successful orientation and movement of the blind, it is necessary to adopt important concepts such as, for example, concepts of the body, its parts, concepts of the relation body - surrounding objects, concepts of the position and shape of objects and their interrelations in space, concepts of topographical characteristics of soil, texture, temperature. Various authors stifle the body pattern as an indispensable factor of good spatial orientation (Sleuwenhock et al., 1995). Body awareness is the information about which person has an idea of his body, the position in the space, its parts (shape, function, length), the position in relation to each other and their movement (direction, intensity and result) (Andreou and MCall, 2010; Bina et al., 2010; Stuart, 1995). A body image is a subjective assessment of an individual's own body, that is, awareness resulting from his knowledge of his own motor and physical capacity and limitations. An irregular body schematic can mask the integration of sensor information during travel, or movements, such as body rotation or distance estimation, speed and duration conditions (Thinus- Blanc and Gaunet, 1997). In order for a blind person to adopt these and other important concepts, this person needs the help of an orientation and movement instructor who understands the lawfulness of adopting these concepts (Zovko, 1994). What can be complicated, difficult, and long-lasting to people who see, simply, daily and spontaneously, to those who have high or total visual impairment. People with visual impairment must learn how to overcome the space around them, how to orientate and move in it. The terms of orientation and movement (mobility), and the process itself are inseparable. Orientation precedes movement or

mobility and is a prerequisite for successful movement. Also, a person needs to understand his current position, to predict novelty in movement and always be oriented (Banovački, 2014). The term concept of the body implies the knowledge that a person has of his own body, and acquired it in the process of conscious learning. This concept includes the ability to distinguish parts of the body and knowledge of their location and function (Zovko, 1994). The concept of the body according to Cratty and Sams (1968) consists of five levels. The first level is the ability to identify the front, back, upper and lower body, the ability to recognize the different positions of the body, and the ability to determine the position of the object in relation to foreign body sides. The second level involves the ability to recognize parts of the body, and the third level involves movements of the body with regard to its sides or plans and the movements of the limbs. The fourth level covers the area of laterality, ie. identifying the right and left sides of the own body, and moving towards the nearest object on the right or left side and vice versa. The fifth level, that is, the component of the concept of the body, is aimed at increasing the success of determining the laterality of body parts of the subject in the immediate vicinity and vice versa (Zovko, 1994). Searching for selections, editing and programming information develops as a consistent individual model that every child uses in learning. The notion of a unique learning model emphasizes the need for individualized instruction for maximum learning (Keogh, 1973).

In our research, the results showed the predicted period of three months of continuous individual work was sufficient for the students to adopt certain concepts about their body and to orient themselves towards it.

The pupils mostly showed deviation in adoption, i.e. misunderstanding of certain concepts when it comes to orientation to one's own body, purely for reasons of speech and the use of words used at their parts, in relation to the words used in the test. On the other hand, the reason may be that the so-called incomplete integration of the movement, which can affect the ability of a person not to respond to the way the researcher directs them. Reference points are related to the body, not spatial, which creates an unstable relationship, valid only when a person is stationed. Otherwise, it is disturbed and we have a problem with the egocentric reference frame, which is necessary for the memory of the path, that is, the creation of a mental scheme of the path, when a blind person moves.

Zovko (1994) conducted a study on the impact of training on the adoption of the notion of one's own body. Data were collected on 11 respondents (6 totally blind and 5 with very small visual remnants), Vinko Bek Center for Education and Training in Zagreb. After the initial examination, the "General Body Orientation" program was conceptualized, which was individually applied with each respondent twice a week for 1 hour. During the implementation of the program, two more measurements were made, and after its completion and final measurement, and thus obtained data in 4 measurements or time points. The results showed that in the initial test subjects did not have enough knowledge about their own body or the body plans. By applying the system training program, there was a positive shift in the knowledge of one's own body, the respondents generally advanced in adopting this term. For orientation and movement in space, the awareness of one's own body, or a good body image, is very important, because our own body is often the basic reference point of orientation, on the basis of which we can determine that something is in front, behind, on the left or right, up or down in relation to the own body. According to Stančić, by children with visual impairment, there is often a delay in the development of image of the body, which negatively affects their ability to orientate and move in space (Zovko, 1994, according to Stančić, 1991). Developing individual skills of blind people can influence the development of their other skills. Koustriava and Papadopoulos (2012) conducted a survey aimed at discovering possible links between the various spatial skills of blind people. Twenty-eight blind people participated in five experiments that examined body knowledge, linearity, orientation, perspective view, spatial knowledge (encoding) of close spaces and spatial knowledge of distant space. According to

the results, there was a positive correlation between body knowledge and orientation. Moreover, for the knowledge of the body and the spatial knowledge (encoding) of the immediate space, they are considered the predictors of a perspective, while for orientation and perspective they are considered the predictors of spatial knowledge. This finding suggests that future research should take more seriously into account the possibility that the development of a particular skill could actually be the result of the development of another skill. Moreover, researches support the idea that the delay in the development of spatial skills does not necessarily have to be the result of the visual impairment itself, but the incomplete development of some other spatial skill.

CONCLUSION

In our country, the importance of developing and encouraging the development of the remaining perceptual abilities, which are necessary for orientation and mobility of blind students, is a current issue. In concluding observations on the results of this research, it seems important to recall the contemporary efforts, which are aimed at ensuring maximum opportunities for the development of all students. Within these efforts, we can also observe blind students and their remaining abilities, as well as their specific needs in the field of orientation and mobility. When it comes to stimulating the remaining perceptual abilities, it is very important to note when the stimulation began, in which age, the motivation, the influence of the family, the stimulation of the students until then, etc. Taking into account these many factors, which influence the perceptual abilities necessary for the orientation towards the mobility of blind people in general, it is also necessary to prepare programmed individual treatments, thus ensuring the use of personal forms of stimulation and teaching, in order to achieve the self-confidence of pupils when moving with a white stick. Unfortunately, in our region, we find examples that blind students are not independent, but depend on others to help them with everyday skills as well as movement. In view of today's understanding and the role of knowing your own body in training blind people for orientation and independent movement in space, the results of this research have a great importance for the rehabilitation of the blind. They point to the need for greater respect for the role and knowledge of blind persons own body in the process of their training for moving in space.

It therefore seems reasonable to conclude that it is necessary to include the programs of rehabilitation of the blind in general, and especially those related to orientation and movement in the area, in the content of this domain. By creating and applying individual programs, it can positively influence the increase in the remaining perceptual abilities towards the own body and physical abilities, and the orientation in the micro and macro environment. On the basis of all of the foregoing, and for the purpose of joint action (team approach), it is necessary to emphasize the role and importance of the expert associate, educator-rehabilitator in the process of education, both in specialized institutions and in the regular elementary school, as an expert who will help the blind student in individual programs and help him develop and encourage all remaining perceptual abilities necessary for better orientation and mobility, and to create a better mental scheme, which is one of the basics for the independent movement of the blind.

REFERENCES

- Andelković, M. (2014). Adaptive behavior of people with visual impairment. *Special education and rehabilitation*, 13 (4): 397-413, 2014
- Anthony, J.L., Lonigan, C.J., Burgess, S.R., Driscoll, K., Phillips, B.M. i Cantor, B.G. (2002). Structure of preschool phonological sensitivity: Overlapping sensitivity to rhyme, words, syllables, and phonemes. *Journal of Experimental Child Psychology*, 82:65–92
- Anthony, T. (2014). Orientation And Mobility (O&M): The Early Years Of Infancy Through Preschool. Available on: <http://www.tsbvi.edu/orientation-amobility/3228-orientation-and-mobility-oam-the-early-years-of-infancy-throughpreschool>
- Anthony, T., Hatton, D., Stewart, K. A. (2008). *Developmentally Appropriate Orientation & Mobility: Facilitating Purposeful Movement in Young Children With Visual Impairments*. Ontario BLV Program
- Andreou, Y., & McCall, S. (2010). Using the voice of the child who is blind as a tool for exploring spatial perception. *British Journal of Visual Impairment*, 28(2), 113-129
- Banovački, I. (2014). *Developing spatial relations for the children with visual impairment. Education and rehabilitation*. Orientation and movement. Available on: <http://ukat.org.rs/index.php/edukacija-i-rehabilitacija/268-orjentacija-i-kretanje-dip-defektolog-i-banovacki?showall>
- Bina, M. J., Crouse, R. J., Fazzi, D. L., & Naimy, B. J. (2010). Administration, assessment, and program planning for orientation and mobility services. In W. R. Wiener, R. L. Welsh & B. B. Blasch (Eds.), *Foundations of Orientation and Mobility: Vol. I. History and Theory* (3rd ed., pp. 389-433). New York: American Foundation for the Blind
- Briggs, J. (1999). *Framework for Independent Travel: A Resource for Orientation and Mobility Instruction*. Canadian Cataloguing in Publication Data Main entry under title
- British Columbia. Ministry of Education. Special Programs Branch
- Bishop, V. E. (1996). *Teaching visually impaired children*. Springfield, IL: Charles C Thomas.
- Češarak, S. (2015). *Basics of orientation and mobility*. Available on: <http://www.kss-ess.si/2015/04/sara-cesarek-osnove-orientacije-in-mobilnost>
- Fajdetić, A. (2012). Blind pupils and adoption of languages in integrated education. Napredak: *Journal of Pedagogical Theory and Practice*, 153(3-4): 463-482
- Filan, S. (1998). Orientation and Mobility. V E. Trief (ur.), *Working With Visually Impaired Young Students: A Curriculum Guide For 3 to 5 Year Olds*, 81–96. U.S.A.: Charles C Thomas
- Kuduzović, A. (2013). *The influence of programmed exercises on the orientation and mobility of blind students*. Master thesis, Faculty of Education and Rehabilitation, University of Tuzla
- Koustriva, E. i Papadopoulos, K. (2012). *Are there relationships among different spatial skills of individuals with blindness?* Research in Developmental Disabilities, 33 (6): 2164-2176
- Keogh, B. K. (1973). Perceptual and cognitive styles: Implication for special education. *First Review of Special Education*, 83-109
- Nenadić, K. (1999). *Relaxation as an auxiliary method of the peripatological program*. Graduation, Faculty of Education and Rehabilitation, University of Zagreb
- Sekulić-Majurec, A. (1988). *Children with disabilities in preschool and school*. Zagreb: School book
- Schultz, M. (1997). Relations between organizational culture, identity and image. *European Journal of Marketing*, 31(5/6):.356-365
- Sleuwenhock, H. C., Boter, R. D., & Vermeer, A. (1995). Perceptual-motor performance and the social development of visually impaired children. [Review]. *Journal of Visual Impairment and Blindness*, 89(4), 359-367
- Stuart, I. (1995). Spatial orientation and congenital blindness: A neuropsychological approach. *Journal of Visual Impairment and Blindness*, 89(2), 129-141
- Teskeredžić, A., Bratovčić, V. i Kuduzović, A. (2012). *Individual program for the ability of the blind pupils. Proceedings of the International Symposium "Sport and Health"*, part two, Faculty of Physical Education and Sport, University of Tuzla, Tuzla: 389-392
- Thinus-Blanc, C., & Gaunet, F. (1997). Representation of space in blind persons: Vision as a spatial sense? *Psychological Bulletin*, 121(1), 20-42
- Vučinić, V. (2014). *Basics of tifology*. Beograd: University of Belgrade - Faculty of Special Education and Rehabilitation
- Zrilić, S. i Košta, T. (2008). The specifics of working with a blind child in preschool and school with a special emphasis on hearing perception. *Magistra ladertina*, 3(1):171-186
- Zovko, G. i Oberman – Babić, M. (1994). Allfactor-abilities as a factor in the orientation and movement of the blind. *Defectology*, 30 (1):1-8
- Zovko, G. (1994). *Peripatology 1*. Zagreb: School newspaper.
- William, R.W., Rivhard, L.W. i Bruce, B.B. (2010). *Foundation of orientation and mobility, instructional strategies and practical applications*. USA: AFB Press