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Space in the statements of blind children at early school age

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People with visual disabilities acquire knowledge about the surrounding space using other strategies than sighted people. The final stage of gathering this information is independent movement in space as well as the ability to describe it. The aim of the article is to present ways space is experienced by blind people and strategies of building mental maps, and to present knowledge about space by creating a description of it. The article also presents the results of research on the description of space by blind children at early school age.

KEY WORDS: space, spatial relations, spatial orientation, visual disability, description of space

Man is a being embedded in the space surrounding them. To get to know it, to explore it, is their innate experience, of which they are usually not consciously aware. Hence, the concept of “spatial experience” describes a mode of exploration and perception of space, and, as a consequence, a set of diverse spatial behaviour modes, such as: thinking about space, using, building spatial structures, etc.”¹ In the

¹ Z. K. Zuziak, *Język urbanistyki i architektoniczne myślenie*, „Czasopismo techniczne. Architektura”, Wydawnictwo Politechniki Krakowskiej im. T. Kościuszki, Kraków 2008, vol. 105, issue 6-A, p. 217.

experience of space, the basic role is played by: the perception of space (sensory reception), cognitive processes, the scope of available terms, the knowledge of one's body schema, spatial imagination, knowledge of one's surroundings, using relationships of distance and time². The best method to get to know the space around is moving about in it. Thanks to such an activity, one can experience it with their entire body, with all senses. In this manner, one collects information, storing it in one's memory to create a spatial structure for a particular environment. Hence, the most direct information about spatial relationships can be provided by our kinaesthetic senses, however, this process is time-consuming. It would be faster to evaluate space through its visual perception³, which lets us receive several pieces of information at a time. The data collected in this manner can be used to interpret distances and locations of items in space. Eyesight plays without a doubt a very important role in spatial orientation. Its lack hinders its exploration, but does not make this process impossible.

In persons who have lost the ability to see, spatial orientation is possible thanks to the other senses functioning well. Of key importance are here hearing, touch, the kinaesthetic sense, the sense of balance and the sense of smell⁴. A very important place in the process of spatial orientation is taken up by hearing, which is the first sense to provide important data on the presence of objects in it, and

² J. Kwapisz, J. Kuczyńska-Kwapisz, *Orientacja przestrzenna i poruszanie się niewidomych oraz słabo widzących*, WSiP, Warszawa 1990, p. 5.

³ Space perception, process through which humans and other organisms become aware of the relative positions of their own bodies and objects around them. Space perception provides cues, such as depth and distance, that are important for movement and orientation to the environment. Explanation of the term quoted from the Encyclopaedia Britannica, <https://www.britannica.com/topic/space-perception> [access: 23.01.2018].

⁴ K. Miler-Zdanowska, *Czynniki warunkujące nauczanie orientacji przestrzennej i samodzielnego poruszania się osób z dysfunkcją wzroku*, [in:] Czerwińska K., Paplińska M., Walkiewicz-Krutak M. (ed.), *Tyflopedagogika we współczesnej przestrzeni edukacyjno-rehabilitacyjnej*, Wyd. Akademii Pedagogiki Specjalnej w Warszawie, Warszawa 2015, p. 296.

permits the assertion, whether the item/ object listened to is stationary or dynamic. In terms of reception of stimuli through the tactile channel, in turn, direct touch by the upper and lower extremities has a lot of importance, as is indirect touch through a long, white cane. Stimuli received by the kinaesthetic sense, in turn, and the sense of balance, permit the blind person maintain a correct body posture and execution of conscious movements of the body, to remember the covered distance. Of slightly lesser importance for spatial orientation is the sense of smell due to the fast adaptation to specific smells occurring in the environment.

Beside the reception of sensory stimuli, the correct development of spatial orientation in persons with eyesight disabilities also includes cognitive processes, in particular attention, memory, thinking and spatial memory. Correctly-proceeding cognitive processes permit the blind person to improve their safety when moving about through the detection and adequate reactions to stimuli from the environment, and getting to know various locations. Correctly developed spatial imagination, understood as the 'ability to create in one's mind an image or geometrical object in accordance with its actual shape and placement'⁵ permits the understanding of spatial relations taking place in space between objects, and to utilise this knowledge when moving about. Persons with eyesight disabilities, based on the experience obtained during moving around, movement and multi-sensory observation, create a cognitive map⁶ of the

⁵ E. Sroka-Bizoń, M. Terczyńska, *Percepcja widzenia – jak kształtować wyobraźnię przestrzenną*. Lecture from the Proceedings of 19th Conference Geometry Graphics Computer. Ustroń, 25.-27. June 2012. Silesian University of Technology, Geometry and Engineering Graphics Centre.

⁶The concept of the cognitive map is used in many areas of modern science. It emerges as a result of complex mental operations (remembering, encoding information, recalling information and planning activities, anticipation of possible situations). It reflects the assumed strategies of execution of the planned objectives and needs in the environmental space. The cognitive map "is a relatively stable mental construct not susceptible to changes of the situation" A. Hauziński, *Ewolucja pojęcia mapy poznawczej w psychologii. Przegląd badań dotyczących hierarchii planów i celów działania*, *Czasopismo Psychologiczne*, vol. 16, No. 2, 2010, p. 285.

space surrounding them. Unequivocally important components in its creation are: pathways (typical components of space, corridors created by communication paths, streets, roads, etc.), nodes (characteristic points present primarily along paths, where behaviours are concentrated, e. g. intersections of pathways or points of interference with these), edges (objects creating spatial barriers, e. g. walls, borders, but also communications paths), districts (regions, larger areas of uniform properties, e. g. industrial zones, residential districts, retail zones) and landmarks (orientation points, characteristic objects permitting spatial orientation, e. g. monuments, buildings or structures noticeable to the person with their use, being in their field of interest)⁷. For blind persons, it is specifically orientation points that constitute a very important component of space that is fixed, ever-present, difficult to avoid. It is thanks to these that they are able to arrange in memory the image of space and verify their correctness of movement⁸.

All the factors named above, being of importance for movement in space by persons with eyesight disabilities, apply primarily to the cognition of space and the creation of mental maps. The external form signifying the correct course of these processes (perception of space and understanding of the spatial relations in it) is the ability to describe space and to freely move about in it. The description of surrounding space requires the use of sensations describing spatial relations. We gain these throughout our lives. Developmentally, first comes the understanding of spatial concepts, only later is their correct use mastered. Hence, one must always keep in mind that “good understanding of messages including descriptions of spatial

⁷ The basic elements of mental maps were suggested by K. Lynch (1960) [in:] K. Nieścioruk, *Kartograficzny obraz map mentalnych przestrzeni miejskiej i jego prezentacja oraz analiza z zastosowaniem narzędzi systemów informacji geograficznej*, Acta Scientiarum Polonorum Geodesia et Descriptio Terrarum, 2013, No. 12(4), p. 28.

⁸ In literature on movement by eyesight-disabled persons, one can find a subdivision of landmarks, orientation points, into two groups: primary landmarks and secondary landmarks. W. R. Wiener, R. L. Welsh, B. B. Blasch (ed.), *Foundations of Orientation and Mobility, Second Editions*. New York, AFB Press, 1997, p. 42.

relations does not go hand in hand with their correct use in own messages sent by the child”⁹.

When describing space through determination of one’s own location and the placement of other items, along with the relations between them, one uses foremost:

- adverbial descriptors of position that: “refer to a specific point described in space, where the speech act occurs, or a point known to the speakers”. Adverbial pronouns of location accompany gestures or replace them, help describe spatial relations of objects or the relations between several items, inform about the movement of an object (here, where to, from where, everywhere, from all around, from here, until here, over here, over there, etc.),
- adverbial locative and lative descriptors that directly indicate the direction and vicinity, e. g.: near: far, high: low, straight forward, topside, below, by the side, etc.,
- spatial adpositional phrases and prepositions. Prepositions describe distance, e. g.: by, beside, near, close by, ahead, opposite, above, below; indicate the state of being surrounded, e. g. around, about, as well as of linearity: along, across; and of laterality, e. g. to the right of, to the left of,
- wordbuilding location indicators that indicate closeness (attach, reach, impact, pour in, etc.), detachment (drive away, exit), movement (pass),
- adjectives using which one can describe complex spatial relations, dealing with locations, dimensions and shapes of objects, e. g. close, far, upper, lower, front, small, round, square¹⁰.

As the perception of spatial relations proceeds mainly in visual space (eyesight permits simultaneous perception of many structures

⁹M. Kielar-Turska, *Jak pomagać dziecku w poznawaniu świata*, Wyd. Szkolne i Pedagogiczne, Warszawa 1992, p. 153.

¹⁰The list was taken from the doctoral dissertation of A. Guzy, *Kompetencja językowa uczniów a wyobraźnia i orientacja przestrzenna*. Unpublished doctoral dissertation, Faculty of Philosophy, Uniwersytet Śląski, Katowice 2011.

in space, especially of distant objects), persons with disabilities usually have difficulty acquiring and correctly using words describing spatial terms, and usually experience difficulties understanding adjectives and adverbs referring to evaluation of distance, size and spatial relations (e. g. close-far, tall-short, etc.)¹¹ and adverbs¹² and adpositional phrases (below, above, to the left, to the right, behind, ahead of, between)¹³.

These difficulties most probably do not arise from interference in spatial orientation, but emerge as a result of the lack of ability of spatial location, or the possibility of tracing with the eye of changing distances, e. g. me-object due to the motion during movement, and in certain cases also due to lack of verbal training spanning the fusion of specific spatial relations with their names. One could indicate as the cause of such difficulties also the specifics of creation of images of space by persons with eyesight disabilities that occurs mainly through kinaesthetic and auditory stimuli. The linguistic component is an addition that amends this image but stems from sighted persons.

Concepts concerning the development of spatial orientation in persons with eyesight disabilities have for the past thirty years been the object of interest of various groups of scientists, psychologists, education specialists, medical doctors. As the scope of abilities making up competences in spatial orientation is broad, the individual researchers have focused on selected abilities from the area of spatial orientation in persons with eyesight disabilities, e. g. the devel-

¹¹ T. Gałkowski, *Trudności rozwojowe u dzieci niewidomych w okresie niemowlęcym*, *Przegląd Tyflogiczny*, 1975, 1/3, p. 8.

¹² Studies conducted by Andersen (1984); Dunlea & Andersen (1992) and Brambring (2006) had shown marked difficulties and differences in the time of mastering by blind children of pronouns of space, like in, on, or, under. For further information see M. Brambring, *Divergent Development of Verbal Skills in Children Who Are Blind or Sighted*. *Journal of Visual Impairment & Blindness*, 2007.

¹³ K. Klimasiński, *Rola wyobrażeń przestrzennych w rozwoju myślenia dzieci niewidomych*. Wydawnictwo Polskiej Akademii Nauk, Wrocław-Warszawa-Kraków-Gdańsk 1977, p. 80.

opment of awareness of the body schema¹⁴, spatial imagination¹⁵, spatial memory¹⁶, etc. Among the research available in subject literature, I have found no papers concerning descriptions of space in the form of verbal statements, hence I have made this issue the subject of my empirical research.

Research methodology

The purpose of the presented study is the presentation of modes of creation of descriptions of space by blind children at an early school age, and the determination of factors influencing the mastering by them of this ability. The study and analyses of the statements of blind children concerning the space in which they move about was part of a larger project conducted as part of preparation of the doctoral dissertation entitled "Space in the actions and statements of blind children at an early school age" under guidance by prof. dr hab. J. Kuczyńska-Kwapisz. This study was conducted in academic years 2013/2014 and 2014/2015 at four education facilities for children with eyesight disabilities in Poland, where intellectually normative blind children are educated (Laski near Warsaw, Krakow, Bydgoszcz, Owińska near Poznań), as well as in public schools in the Masovian voivodeship (Płock, Radom). The research group was made up of fifty blind pupils, aged six to 12 years. When qualifying children to participate in the research, three criteria were taken into account: functional blindness (children blind from birth or those who have lost their eyesight before the age of three), age (between six and 12 years of age), and no further disabilities (intellectually normative pupils, without additional issues in terms mobility or sensory perception). Due to the object, purpose and character of the study, the choice of the analysed group was purposeful. In the group of fifty analysed

¹⁴ Study conducted by researchers from the United States: B. J. Cratty, C. Peterson, J. Harwis, R. Schoner (1960) and in Poland by Władysława Pilecka (1980).

¹⁵ Study conducted by Krzysztof Klimasiński (1977).

¹⁶ Studies of Susan Millar (1975) and Gordany Miletic (1995).

blind children at an early school age, there were 21 girls (42% of all analysed children) and 29 boys (58% of the analysed children).

As part of the conducted research, two leading research methods were used: the diagnostic survey and diagnostic experiments. As part of the first method, the technique of document inspection and the interview were used. Analysed were personal documents of the pupils located at the special education facilities for children with eyesight disabilities (analyses of medical, psychological and pedagogical documentation). The utilised technique permitted the collection of initial descriptive and quantitative data on the individual pupils. Interviews were conducted in turn with teachers/ caretakers of grades 1-6 of primary schools for blind and weak-sighted children; with boarding house caretakers or parents of blind children; with spatial orientation teachers working at the individual facilities. The utilised technique permitted the collection of detailed information concerning functioning in terms of spatial orientation of children at schools, boarding houses, homes. The second utilised method were diagnostic experiments¹⁷ (utilised technologies: diagnostic tasks, observation). Due to the fact that the theoretical considerations indicated the leading model of development of spatial orientation in children (Piaget's theory of development of spatial orientation and post-Piaget studies), the method of diagnostic experiments was chosen, maintained in the convention of tasks per J. Piaget. It permits the evaluation of abilities from the area of spatial orientation and the indication of causes and conditions of the state of affairs. The studies also user observation¹⁸ of children's behaviour during the execution of diagnostic tasks.

¹⁷ Diagnostic experiments were broadly used by the renowned psychologist J. Piaget when studying the child's mind. In Poland, this method was continued by A. Szemińska, Z. Semadeni but mostly, on a grand scale, by E. Gruszczyk-Kolczyńska (studies on spatial orientation, mathematical skills, etc.). This method is based on the assumption that "an experiment is a kind of observation conducted under specially organised conditions" M. Łobocki, *Metody badań pedagogicznych*, Oficyna Wydawnicza „Impuls”, Kraków 2000, p. 146.

¹⁸ The technique of arranged observation was used, whereby "the studying arranges the observed events/ phenomena: they cause them, provoke their emer-

Proprietary research tools were used for the execution of the study¹⁹: a questionnaire to analyse documents, teacher, educator, spatial orientation teacher interview questionnaires; the package “Functional evaluation of selected abilities in terms of spatial orientation for visually-impaired children aged seven to 12”, containing diagnostic trials, observation sheets for child behaviour and a scale guide used for the interpretation of results. One of the parts of the mentioned diagnostic set was a diagnostic task named “Path”, the purpose of which was the inspection of abilities of description of space by blind children. The person conducting the study asked the same of every child “Describe the path you take from the entry door to the school to your class bench. List the places you pass along; tell about the turns and curves you take”. The time allotted for the child to complete the task was unlimited, it could start over if it believed it forgot something during the description of the path. The child’s statement was registered digitally using a voice recorder. Afterwards it was listened to and written down as text. The research material obtained in this way was analysed for the following items used by the children in the descriptions: spatial concepts, orientation hints and points, words describing temporal succession, other specific words.

Test result analysis and interpretation

In course of the conducted analyses, it was determined that blind children, describing space they know, name consequently the activities executed when moving about, using verbs: walk, descend, ascend, turn. Children also listed the orientation markers placed

gence, and then observe them” [in:] M. Guzik-Tkacz, *Badania diagnostyczne w pedagogice i psychopedagogice*. Wydawnictwo Akademickie „Żak”, Warszawa 2011 p. 256.

¹⁹ Due to the fact that the Polish market lacks tools for diagnosing children’s competences in terms of spatial orientation foreseen for children with sight disabilities, constructed were tools taking into account the specifics of extravisual perception and stages of gaining abilities from the area of spatial orientation.

along the path. They indicated elements of their environment they perceived through touch of their feet and hands (elevation, heater, etc.), not indicating any auditory components of the environment (no description by any child included data conveyed through the auditory channel).

The analysis and properties of the individual components of space utilised by blind children to create mental maps of the described space was included in table 1.

Table 1. Properties of components of the mental map in blind children at an early school age

Mental map components per K. Lynch	Properties of individual components of the mental map	Examples of individual components of mental maps – blind children
Paths	typical components of space, corridors created by communication paths	corridor, hall
Nodes	characteristic points present primarily along paths, where behaviours are concentrated, e. g. intersections of pathways or points of interference with these	staircase, stairs, wall
Edges	objects creating spatial barriers, e. g. walls, borders, but also communications paths	wall niche, wall with wash basins, small wall
Districts	regions, larger areas of uniform properties, e. g. industrial zones, residential districts, retail zones	cloakroom, classroom, dining hall, teachers' room, doctor's office
Landmarks	orientation points, characteristic objects permitting spatial orientation, e. g. monuments, buildings or structures noticeable to the person with their use, being in their field of interest	bench, door, carpet, hill, heater, window, hand-rail, pillar, waste basket

Source: own work.

A further component that appeared in the descriptions of space by blind children were names of rooms that the children passed when moving along the described path (e. g.: class room, kitchenette), names of objects (e. g.: bench, heater, fire extinguisher), locations (e. g.: staircase, hall), as if they were placed along a single line. Blind children participating in the study used in such descriptions most frequently the words "then", "later". These words are used to describe relations of time, however, blind children used them to describe relations in space, meaning, they perceived the objects they passed along in a linear, and not a spatial perspective. This fact shows that children remembered the route they moved along more precisely, however, they were not able to convey the relations between the objects or locations they passed along side of. For example, I quote the statement of Kacper, aged nine.

„One needs to walk straight, then slightly left, then descend this small hill, then straight along the green, then until the pavement, then the first pair of small stairs, then the second pair of small stairs, you need to walk straight beside the primary school secretary office, or something like that, then pass through the door of the primary school and one needs to walk to the right, and there will be the second door on the right side.“

The analysed statements of blind children observed was also minor differentiation of the spatial concepts they used. These were mostly terms like 'to the right' and 'to the left', referring to the turns and curves they executed on their way. Terms like 'in front of me', 'opposite', 'beside' appeared less frequently. In some instances, the descriptions prepared by the children were composed mainly of turns and curves to the right or left, without indications of the specific point where such a turn was to be executed. Such situations can likely be explained by the use of the kinaesthetic sense and muscle memory by the blind persons during the movement. These let one remember, what activities need to be performed during the movement, without the need to verbally indicate the position of execution

of a specific motion in space. To visualise the above description, consider the statement by Julia, aged eight.

„I walk to the left, then to the right from the cloakroom, then to the left again, and the door to my class is to the left. I walk and turn to the left, then straight and to the door, and I turn to the main hall to the left.”

An analysis of the statements of blind children considering the spatial terms used was included in table 2.

Table 2. Properties of spatial terms in the statements of blind children at an early school age

Spatial terms	Sighted persons	Blind children
Place indications using pronouns, adverbial pronouns of location	here, to where, from where, everywhere, from here, until there, over here, over there	not observed
Adverbial locative and lative descriptors	near: far, high: low, straight forward, topside, below, by the side	sideways, straight ahead
Spatial adpositional phrases and prepositions.	by, beside, near, close by, ahead of, in front of, above, below, around, to the right, to the left	beside, ahead of me, by, opposite, to the right, to the left, in front of
Wordbuilding location indicators that indicate closeness, detachment, movement	attach, reach, impact, pour, drive away, exit, pass	reach, ascend, descend, enter, exit, pass
Adjectives to name complex spatial relations,	close, far, upper, lower, front, small, round, square	long, small

Source: own work.

In spatial descriptions by blind children observed was also the usage of words that indicate imprecise descriptions of the distances covered during the march, e. g.: “I walk a little bit”, “a bit of the hall”, “somewhat to the right”, “I walk a bit”, “I walk for a longer time”, etc. The usage of such descriptions shows that for a blind

child it is somewhat difficult to precisely describe the path they cover using measures of distance (metre, centimetre, etc.). This stems from the lack of visual control of their environment.

However, during the analysis of descriptions of space, surprising became the fact that blind children used names of colours concerning the points they passed or relevant structures, e. g.: "I reach the green stairs", "I enter the orange corridor", "I pass the green staircase". Despite the inability to verify colour data, blind pupils have acquired their names and use them to describe space so as to be better able to communicate with sighted persons.

Based on the analysis of the collected research material, due to the level of complexity of the ability to describe space, the statements of the analysed children were subdivided into three main levels: the basic level, the intermediate level and the advanced level. On each of these levels, in addition three types of descriptions were differentiated between. A detailed subdivision of the levels of abilities to describe space was indicated in diagram 1.

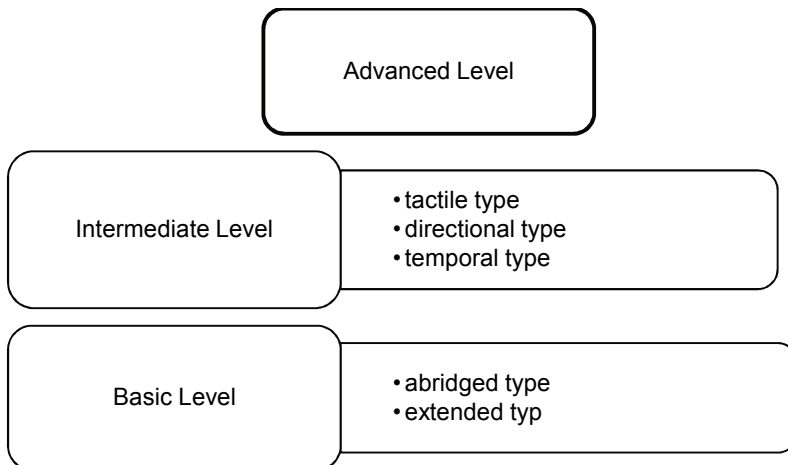


Diagram 1. Levels of mastery of the ability to describe space

Source: own work

Among the analysed children, 46% provided descriptions of space on the basic level. This description was chaotic, contained haphazard information, omitted important details. In this group the majority were seven-year-olds. More than half of them used the abridged description type, meaning, one lacking information on space. The description did not include spatial terms, however included information about turns, without indications of their direction. The remainder of seven-year-old children used extended type descriptions. These contained a lot of information on places, executed turns, information points, but these were not arranged into a logical whole. As an example of a basic description, of the abridged type, I quote the statement of Alan, aged 7.

I take the elevator I exit the elevator, well then I walk straight and I am in class. I walk straight I enter the elevator I go to the ground floor and that's it

However, as an example of a basic description of the extended type, here is the statement by Hati, aged seven.

We enter the cloakroom, I exit the cloakroom I go right, then straight, and then at the two barriers I go left. I exit and go straight, through the corridor

In the analysed group of children aged eight to 11, intermediate descriptions of space dominated (42% of the studied children). This description was characterised by a large volume of information referring to tactile data received by the hands and feet (tactile type), or was focused on the turns and curves executed during the movement (directional type), or referred to the objects passed along and the places with the use of temporal descriptions: then, later (temporal type). Examples of such description types, on the intermediate level, are provided below.

Patryk, aged eight, intermediate level, tactile type.

I exit to the left, and one walks and walks and one passes hall no. 1b, then one turns and makes this curve and descends 13 stairs down-

wards, there's a barrier to grab onto it, and then one turns and enters and that's it.

Hubert, aged nine, intermediate level, directional type.

I enter the school, I walk to the left, then to the left and right, a bit straight and then to the left and to the right, straight, to the left and straight and then I pass by two pairs of doors, and the fifth door to the right.

Anna, aged nine, intermediate level, temporal type.

From the group, I walk straight, straight, straight a little bit more and I pass the bathroom, then straight and to the left and then I walk straight and to the green staircase, and I pass the hall, and then there's mine.

Only 12% of all the studied blind children used advanced-level descriptions, and these were eleven-year-olds. This description type included phrases referring to spatial relations between persons, objects in space, locations. It also included verbs concerning the activities performed during the movement. The descriptions were coherent, material, exhaustive. To visualise the above characteristic of these descriptions, here is a statement by Wiktorina, aged ten.

My class is on the left side, I walk along the primary school corridor, I exit the corridor, I pass the stairs to the auditorium, then I turn left, descend the green stairs to the ground floor, on the left there will be a bench, and I have to turn right, and ahead of me there's the guard-house.

Summary and conclusions

Based on the above data, one may conclude that blind children develop their competences in terms of descriptions of space together with the acquisition of other abilities in the area of spatial orienta-

tion, and these are related to the age and experience collected by the children. Evaluating the levels of description of space by blind children, one needs to remember as well that beside the indicated factors, of material importance in this regard is the intermediary (teacher, parent, therapist, etc.). It is this person who teaches the child describing through their own statements, the words they use. The intermediary is a very important factor, which can be substantiated by the fact that among the studied blind children those that were unable to provide descriptions, or those whose descriptions were fragmentary, always referred to situations in which the teacher guides them without conveying information about the space surrounding them. For a little child, who is only learning to interpret space, gathering verbal information is of key importance, as it amends and explains the tactile sensations.

Persons with sight disabilities, despite difficulty in terms of cognition and interpretation of the space surrounding them, as a result of gathering of daily experiences, are able to understand space and use this knowledge during exploration. These activities demand much more effort from them, and much more time than is the case for sighted persons due to the fact that space is easiest explored through sight and the kinaesthetic experience – movement. Despite other strategies of gaining spatial knowledge, persons with eyesight disabilities are its active participants and are able to describe their surroundings, just like seeing persons. Such a description is in many respects similar to a description constructed by a sighted person. Blind persons have the same strategies of creating mental maps used to create sensory representations of the explored space, a fact substantiated by the presence in both groups of the same components of cognitive maps (paths, nodes, edges, districts and landmarks). The differentiating factor between the two groups is the volume of the individual components present. In sight-disabled persons, the usage of a higher volume of orientation points is clear, as is their qualitative differentiation (tactile, auditory, olfactory, thermal landmarks, etc.). Both blind as well as seeing persons use for the most part use the same words to describe space (adverbs,

adpositional phrases, pronouns, adjectives, etc.), even though their volume and scope of their use with eyesight-impaired persons is smaller.

The ability to create a description of the space surrounding one is a process perfected over the entire course of one's life. Both sighted as well as blind persons this process is related to one's age and the experience gained during movement. In addition, in sight-impaired persons, a very important role is played by intermediary persons (meaning – parents, teachers, etc.). For this reason, it is very important for this ability to be perfected in a correct manner, meaning, through the use of precise, detailed descriptions concerning spatial relations.

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