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# SPATIAL ORIENTATION OF PEOPLE WITH VISUAL IMPAIRMENT

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## *Abstract*

Spatial orientation and independent mobility comprise one of the area's most markedly affected by the loss or impairment of visual perception. Independent mobility and the interrelated spatial orientation are a prerequisites for increasing the self-sufficiency of an individual with visual impairment, usually also becoming a significant measure of their self-evaluation. In addition, spatial orientation tends to be perceived as the main indicator of independence and success of a person with visual impairment from the perspective of the majority of society as well as the person with visual impairment him/herself. Our research was based on the question of how the area of spatial orientation and independent mobility is perceived by three groups of participants: persons with visual impairment, professionals working with them, and the lay public. Its purpose was to explore and describe selected aspects of orientation and mobility from the perspective of the actors themselves – i.e., persons with severe visual impairment and the professionals involved. Therefore, over the period of six months, we organisations for adults with visual impairment, school counselling facilities (Special Educational Centres) and schools intended primarily for pupils with visual impairment, to receive answers from service users, pupils well as their instructors. We decided to address the lay public only later, after the after the initial study was completed. Our intention was to perform a primary probe into the chosen field of interest and identify the interesting aspects suitable for follow-up an applied research.



**Keywords:** Spatial orientation, mobility, visual impairment.

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# 1. Introduction

For a majority of individuals in our society, independent mobility is something they cannot imagine living without, both in their personal and professional life. As a result, we associate independent mobility with orientation in space, which very often depends on our senses. As soon as one of them is weakened or even fully disabled, difficulties ensue and that sense must be compensated for, both by the remaining senses and compensatory aids. Persons with severe visual impairment represent one of the groups whose spatial perception through vision is restricted or disabled. Therefore, in the following paragraphs, we will describe not only the categories of persons with severe visual impairment but also the development of independent mobility and spatial orientation in persons with severe visual impairment in the Czech Republic.

## 1.1. Determination of the Category of Persons with Severe Visual Impairment

Persons with visual impairment represent a broad category of persons with a condition which, even after the maximum possible correction (pharmacological, surgical, and optical) causes difficulties in their everyday activities. Persons with visual impairment can be considered from several perspectives; for us, the special education and medical perspectives are the crucial ones. In terms of spatial orientation, these two classifications intertwine and create: a complex framework for creating a definition of people with visual impairment. In the field of Special Education, there are multiple criteria used (enumerated in the following paragraph) to create a detailed, granular understanding of the person's needs with regard to their education as well as participation in sports and other leisure activities. On the other hand, the medical definition operates mainly with the definitions of visual impairment levels based on spatial vision or field of vision.

Classical Special Education categorises persons with severe visual impairment based on the following criteria – time of origin (prenatal, perinatal, postnatal time of origin), duration (short-term, long-term, recurrent disease/defect), age of the people with visual impairment (early age, pre-school age, school age, adulthood, senium), causes of visual impairment (organ and functional defect), type of visual defect (loss of visual acuity, loss of field of vision, loss of the ability to perceive the whole colour spectrum, level of the ability to process visual information, oculomotor difficulties, level of visual impairment (blind persons, persons of low vision, persons with binocular vision disorder) (Růžičková, Kroupová, & Kramostilová, 2016; Kroupová, 2017; Regec, 2015).

Thus, the individual categories of visual impairment are defined so that each of the defined groups can be provided with optimal support and an adequate network of services aimed at the maximum possible level of inclusion of the individual in all the areas of professional, social and cultural life, depending on their individual needs and abilities. With the current trend of continuous support, the requirement of adequate optimised support does not apply only to the persons who are in the educational process in the traditional sense but accepts the whole age variability across the age spectrum up to seniors. The ophthalmological view of the categorisation of persons with visual impairment does not reflect some of the aforementioned specifics and specialises in determinations based on the criteria of impairment levels of the central visual acuity and the loss of the field of vision level, or presents a detailed classification of diseases of the eye and ocular adnexa, which do not have to achieve the levels of visual impairment as such. The

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typical, most commonly used example of an ophthalmological definition is the WHO classification according to the ICD-10 (Růžičková & Kroupová, 2017).

### 1.2. Development of Spatial Orientation and Independent Mobility (O&M) in CR

In the territory of the former Czechoslovakia, part of which is today's Czech Republic, the approach to orientation and mobility in persons with severe visual impairment started developing institutionally in the 1970's, under the influence of and thanks to Jesenský and Wiener. In those years, methodology was prepared, continuously improving until the 1990's, when it was anchored even in the Education Act, in a modified form as a methodology for an unclassified mandatory subject for pupils with severe visual impairment or total blindness. For us, this means that individuals with severe visual impairment since birth or early childhood should, after completing their compulsory schooling, have abilities and skills sufficient to move around fully independently and safely. The same methodology is used to improve or practice new routes or to practice spatial orientation in adults with severe visual impairment (acquired in adult or senior age) within non-profit organisations focusing on adults with severe visual impairment (SONS – Tyfloservis, Kafira and other local organisations) (Wiener, 2006; Voženílek, Michalík, Brychtová, & Vondráková, 2014a; Voženílek & Vondráková, 2014; Růžičková, Kroupová, & Vondráková, 2018; Voženílek at al., 2014b, Vondráková, & Růžičková, 2018)

The methodology includes three basic practice areas – walking without a cane, walking with a white cane and analytical – synthetic activity.

1.Walking without a cane

Before a person with visual impairment starts using a white cane with proper instructions and systematically, they need to develop the elements of independent mobility and spatial orientation, including walking without a cane (walking with a seeing guide, upper and lower body protective techniques, and trailing), as well as the development of the individual's natural orientation skills (limiting deviations from the straight direction, angle estimate, strengthening stability, walking stairs both aided and unaided, slope recognition, etc.)

2.Practising walking with a white cane

This involves gradual practise of the usage of the white cane, obtaining sufficient information through it to help the individual to independently go from short routes without obstacles, through short routes with obstacles, longer routes, walking stairs, up to searching for targets both on short and long routes. In the training, the person with severe visual impairment is assisted by an instructor or teacher, who shall gradually release the contact up to the moment when they make sure that the person manages the practised route completely on their own.

3.Analytical – Synthetic Activity

This means using information of any kind, from any sources, so that the individual is fully self-sufficient and independent when moving along their route. The practice of this activity can only commence

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after the person has mastered the two previous stages of independent walking without difficulty (Wiener, 2006; Růžičková & Kroupová, 2017).

Independent walking is closely connected to spatial orientation; therefore its substantial practice forms an integral part of the lives of individuals with severe visual impairment from early childhood to senior age. After thorough practice and fulfilment of the internal motivational elements in the individual, they are at least partially self-reliant on the routes, in the places and areas where they wish or need to be.

## 2. Problem Statement

In the paragraphs above, we have defined not only who a person with severe visual impairment is but also what stages of spatial orientation and independent mobility practice they have to complete to achieve safe walking, to feel safe and to arrive safely from one place to another, to take care of themselves or to attend the leisure activities of their children or other family members. However, what we have also stated above is that the referenced methodology has been in practice since the 1970's, and the only improvement has been in the quality of instructors teaching the individuals and guiding them to independence in this aspect of their lives.

Considering the age of the methodology as well as the fact that the author of this contribution herself is an O&M instructor, we came across the idea that the view of independent mobility can be profoundly different among the instructors, teachers, people with visual impairment themselves as well as the lay public and it can also change over time. Therefore, we decided to take a look at the issue through new optics and from a new point of view.

## 3. Research Questions

The aim of our research was to view the field of spatial orientation of persons with visual impairment from their own perspective, from the perspective of professionals dealing with this topic and last but not least from the lay public's perspective. The main premises of our research included the following:

- We assume that persons with visual impairment perceive a number of aspects of spatial orientation and independent mobility as problematic, burdensome or frustrating.
- We assume that the professionals working people with visual impairment, who are also involved in the spatial orientation topic, are able to identify the problematic aspects, both from the clients' point of view and from their subjective professional insight. In laymen, we do not assume any substantial knowledge in this area.
- We assume that in the area of independent mobility and spatial orientation, the people with visual impairment also need substantial external motivational elements in addition to their internal motivation.

## 4. Purpose of the Study

The main purpose of our study was to examine orientation and mobility in persons with severe visual impairment through new/contemporary optics. Our intention was not only to map the current condition of the issue from the perspective of the three aforementioned groups but also to encourage the respondents to think deeply about this topic. From the individual responses, we were then able to form non-quantified

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conclusions that will further help us with the issue in question, both in further research and in the author's practice.

Independent mobility is an integral part of our lives but cannot happen without interaction with the environment, which is why it was important for us to find out if the surroundings do reflect the needs of individuals with visual impairment. Better understanding of the needs of those with visual impairment allows us to develop a more responsive methodology, which will in turn mean that spatial orientation and independent mobility practice will be less onerous, and mainly that the day-to-day tasks of movement along a given route will be easier.

## 5. Research Methods

In order to obtain as much information as possible within a relatively short time period, we utilised a questionnaire format. The questionnaire method was supplemented with a controlled interview with the respondents who were nearby and were willing to share their ideas with us directly (Brace, 2018). To make our research complete, three types of questionnaires were prepared on the same topic, with some of the questions matching.

The first of the questionnaires was intended for the persons with severe visual impairment themselves. To recruit these respondents, we used the so-called snowball sampling method, recruiting others via the individuals cooperating with us traditionally and the organisations or schools for people with visual impairment. The second questionnaire was addressed to professionals working with persons with visual impairment, either in schools or adult organisations (Kafira, Tyfloservis, Tyflocentrum, etc.). The third questionnaire, composed as the final one to complete the whole picture, was intended for the lay public and was distributed online through the questionnaire server - vyplnto.cz.

### 5.1. Evaluation Method

Since we did not manage to raise a representative sample even despite our belief that the sample is relatively large in terms of our intentions and possibilities, we decided to evaluate the questionnaires and interviews using the classic method of description, using the open coding method for the open questions. Thereafter, we compared the three aforementioned sets in terms of similar questions and described the results. The research results are provided in the following section.

## 6. Findings

We managed to collect information from 47 respondents with visual impairment across the whole age spectrum, from 19 professionals, and intentionally from the same number of laymen from the general public. As regards the group of respondents with visual impairment, we can say that it contained persons both across the whole age spectrum and the range of levels of severe visual impairment, also having a balanced number of men and women. The research set of professionals also contained a diverse age spectrum; however, in terms of gender, responses from women prevailed and the same applied to the lay respondents.

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Within our research, a large number of questions was asked, which we subsequently evaluated through open coding based on several basic areas specific to spatial orientation in persons with visual impairment.

### 6.1. Most Difficult Aspects and Limits in the O&M Area

Regarding the most difficult aspects, i.e. limits and problematic areas in orientation and mobility (O&M), all the sets of respondents identically mention the environmental conditions, difficulty of transport, weather volatility and the significance of the individual's personal skill. In particular, the groups of professionals and persons with severe visual impairment put emphasis on the issue of orientation in an unknown and busy environment, occurrence of unexpected obstacles, crossing roads or travelling by a different means of transport. For all of the areas in question, a majority of laymen most frequently responded the same way. An interesting contrast appeared in the items "crowd/groups of people" versus "depopulated areas". Both of them are unpleasant, both bear some kinds of risks, and in spite of their different nature, both situations provide potential restrictions and concerns to persons with visual impairment. Two interesting items within this category are the risks of weather or rushing (time stress), which contradict the principle of safety, since they cause a decrease of concentration and increase of stress levels. This aspect was also emphasised by professionals.

An interesting contrast among the respondents emerged in the question of help from other individuals in the near physical area – both excessive effort and reluctance have negative consequences. Professionals as well as persons with severe visual impairment identified unwanted as well as unprofessionally provided help as problematic. But only few members of the lay group displayed an understanding that intervention from the (lay) public could have negative consequences. In general we can say that both people with visual impairment and the professionals working in the O&M area are able to recognise limits and obstacles which are of a technical as well as psychological nature; however, among the general public it depends individually on whom the people with visual impairment meets when needing support in their mobility or orientation.

### 6.2. Motivation and Support in the O&M Area

Within the research sets of professionals and people with visual impairment, the following key elements were identified as the sources of external motivation: family, friends, school, and institutions for people with visual impairment. It is apparent that the listed elements also represent the crucial factors of socialisation or social inclusion. In this respect, the indisputable importance of O&M for the socialisation of an individual with visual impairment must be emphasised. In terms of motivation, verging on the borders of external and internal factors, an interesting aspect emerged in the option of self-identification with a role model – a successful representative of persons with visual impairment. Moreover, this motivational element was stressed not only by the people with visual impairment themselves but also by the professionals and laymen. The following statement of one of the female respondents with visual impairment also verges between external and internal motivational factors: "Mostly, whoever needs my help with arranging something, if it is for someone else and not for me, provides me with higher motivation and subdues my escape reactions (panic)." For persons with visual impairment, a sighted guide and maybe even the lack

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thereof, can be a motivating element; however, contrary to the previous aspects, this is a negative sort of motivation. There was agreement among the respondents from all research sets in the internal motivation area. The need for self-sufficiency, independence, personal freedom, a feeling of success and willpower as well as the never-give-up attitude have proved to be the key factors. The need for independence and self-sufficiency can be illustrated by one of the comments from a respondent with visual impairment: "At least a relative feeling that I'm not permanently dependent on the help of sighted people." However, there were much more down-to-earth factors, such as the provision of basic needs (from the professionals' perspective).

In the question of sources of support for independent mobility and spatial orientation, there was also agreement between the research groups – again, as in the case of motivation, the family, school, and institutions working with people with visual impairment as well as the O&M instructor play an important role here. What we see as positive here is the fact that the professionals involved were able to adequately identify the key sources of support for the persons with visual impairment in the O&M process. However, the group of persons with visual impairment also emphasised the "non-material" sources of support, which usually overlap with the area of motivation and thus accentuate the importance of their role in O&M – life experiences, a desire for independence, self-confidence, decency, their own viewpoint and composure. One of the comments from a respondent with visual impairment mentions family and school as the source of support for practising independent orientation. However, we often come across the situation when family and sometimes even the school (especially those of inclusive character) are rather the source of stagnation in spatial orientation (due to various reasons such as anxious or over-protective nurturing, and lack of time and competences for teaching independent orientation, etc. in the case of school). The necessity of active work with family directed at supporting independent orientation is also documented by the following comment: "Beforehand, they were worried about me a lot and it took a while before they got used to it and trusted me that I can manage. Even today, they are still scared that something might happen to me."

### 6.3. Possible Modifications to O&M for the Future

In addition to the problems and stress factors, we asked the groups of professionals and individuals with visual impairment about the positive aspects of O&M in terms of their wishes, possible changes and the most important aspects thereof subjectively. Apart from the common features identified by both target groups, such as feelings of confidence and safety, the necessity of awareness in society and continuous development and use of compensatory mechanisms, the professionals also stressed the importance of a knowledgeable and qualified instructor, consistency in the O&M practice, the role of family and necessity of intense work with the family aimed at supporting the people with visual impairment. However, the professionals also accented the psychological dimension of spatial orientation, stressing the role of motivation, independence, psychic well-being and ability to learn, overcoming fear and, last but not least, the significance of the instructor-client relationship.

It is apparent from the facts indicated that the psychological context of O&M is the basis for the success and effective training. Within intentions of the most important O&M factors, the respondents with visual impairment demonstrated a significant level of introspection and self-reflection, for example when stressing the necessity of familiarity with the route and obstacles, the importance of adequate reactions,

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independence, the preference of one's own judgement and other factors. The role of a guide and helpful and willing society was also mentioned. In this context, one of the female respondents emphasised the interactivity of the communication process and social interaction very concisely: "I suppose that for me, a good relationship with people is the most important thing, since a sociable granny is the best navigation system!" Next, one of the professional respondents commented on the role of the guide as follows: "If a client uses the guide services abundantly, their motivation to learn some routes may be lower, relying more on the choice of guide services." In terms of improvements in the O&M area, the barriers and elimination thereof emerged as the common themes (even regarding the extension of acoustic and tactile orientation elements in the environment) and public awareness again. Thus, successful O&M is conditioned not only by the individual's abilities (psychological, physical), material and technical requirements (environment, aids) but also an aware and empathetic majority group in society (Vondráková & Růžičková, 2018; Vondráková, 2013, 2016). Many aspects mentioned by the respondents in the primary research were of an introspective nature – faster learning (routes), the ability to deal with unexpected situations, the determination to master O&M, the ability to ask for help, accepting limits. The overall wishes of respondents with visual impairment and professionals in the field of spatial orientation and independent mobility pointed in a similar direction as the need for improvement – fewer barriers and obstacles, more favourable environmental modifications, refinement of the navigation technologies, as well as an informed, considerate and helpful public. In addition to the aforementioned aspects, in their wishes, the professionals also focused on the development of a professional qualifications in the O&M area and better accessibility for clients with visual impairment.

## 7. Conclusion

The purpose of this research was to describe and evaluate selected aspects of spatial orientation and independent mobility from the perspective of the actors themselves – i.e. persons with severe visual impairment, the professionals involved and lay public. In this closing part of the text, we will try to address the aforementioned premises and to paint a complete image of the spatial orientation and independent mobility of persons with visual impairment based on the obtained and described data.

Considering the insufficient saturation of the research sets and the open associative nature of the questionnaire items, it was neither possible nor appropriate to evaluate the data statistically. In terms of interpretation and discussion regarding the results, we are moving on the borderline of pure description and considering the isolation of the results, we will only generalise them in relation to theory.

Within the intentions of the first research thesis, a total of six semantic categories were identified (environment, weather/climate, personal features, physical limits, transport and social surrounding), integrating the problematic aspects regarding spatial orientation in persons with visual impairment. Eventually, more than forty problematic, limiting and potentially stressful factors were identified. In many cases, these factors were identified not only by the group of persons with visual impairment but also the other two groups of respondents, whereby we move on to the answer to the second research thesis. In more than ten cases, both the professionals and laymen agreed upon the limiting or problematic aspects of O&M, or at least, the laymen's responses did not differ (the results were less pronounced here compared to the two aforementioned groups). We can state that the professionals working with people with visual

impairment in the O&M area do have competences and experiences enabling them to identify the potentially problematic spots within the spatial orientation of an individual with visual impairment.

In the question of motivation and sources of support, we come across factors such as "feelings of success – managing something on my own" or "self-confidence" and "inner persuasion that you must not give up". It is obvious that the self-evaluation area is purely subjective and individual; however, we may say that it is one of the discussed aspects connected to O&M. The role of O&M in the self-confidence of a person with visual impairment was emphasised by the professionals working with people with visual impairment, who awarded it a dominant position among the determining factors of self-confidence. Again, from all these areas, the results from the lay public are less convincing – in this field, the laymen were not sure about their answers and mentioned motivation in all the suggested categories.

In terms of motivation, a wide range of factors from internal and external motivation areas were identified. There are no doubts about the importance of internal motivation; however, many factors affecting the external motivation play an irreplaceable role in the O&M area.

Our effort within this research was only to perform a primary probe into the chosen field and thereby to identify the interesting aspects suitable for follow-up within an applied research program.

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