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Forum Pedagogiczne
2018/2

Wpłynęło: 30.03.2018
Zatwierdzono do druku: 26.09.2018
DOI: 10.21697/fp.2018.2.15

COGNITIVE FUNCTIONING OF A BLIND STUDENT IN A FOREIGN LANGUAGE CLASSROOM

Abstract: This paper deals with the specific character of cognitive functioning of blind children and adolescents with respect to perception, attention, memory, information processing and Theory of Mind. It also discusses the impact of this specificity on foreign language learning. Empirical research on the influence of visual impairment on cognitive functions is discussed, and foreign language learning is presented from the viewpoint of theories which look upon this process as a result of cognitive operations, oriented towards developing communicative competence. The situation of a blind learner in a foreign language class is discussed both from the perspective of challenges a blind student has to face and also from the perspective of opportunities to diminish the gap between the blind and the sighted thanks to the content included in foreign language textbooks.

Keywords: visual impairment, blindness, cognitive functions, foreign language learning.

Introduction

In the recent years the focus of pedagogical science has shifted from teaching to learning processes, including but not limited to those taking place in the school environment. Putting learning at the centre of interest for modern pedagogy sets new directions for future research, with special attention paid to analyses of cognitive processes. Knowledge on how information is obtained, coded and processed, and how new data are integrated with existing mental categories is

indispensable when it comes to describing and accounting for learning processes and problems occurring therein (Hejnicka-Bezwińska 2008). Focus on cognition is particularly significant in studies related to students with disabilities, whose developmental trajectories may in various ways diverge from those attested in typically developing population.

The group of students with special educational and developmental needs includes blind students. Sight plays a special role among all the senses, as it enables fast and virtually effortless access to many kinds of information in the environment. It also facilitates organizing and making use of such information in order to accommodate one's behavior to the situation. Since blind students are deprived of visual information integrating data obtained by means of the other senses, and since they are unable to acquire knowledge and skills through observation and imitation, their developmental conditions can be described as challenging. The risk concerning the occurrence of gaps and false beliefs in the representations of objects, people, natural phenomena, as well as social and interpersonal situations is significant in this group (Steele 2015). To compensate for the lack of sensory input and to minimize its impact on cognitive development, it is then necessary to organize the teaching-learning process in such a way that the developmental characteristics of blind students are catered to. The key issues in adapting the teaching-learning process to the needs and abilities of students with visual impairment is the teacher's awareness of how congenital blindness affects cognitive functioning and his/her ability to apply this awareness in every-day practice in order to implement solutions that would work best for a specific student.

The objective of this paper is to discuss some results of studies carried out on the development and specific characteristics of cognitive functioning by congenitally blind individuals in the context of the learning process. The impact of cognitive processes on learning and its implications for organizing classroom activities are exemplified with problems concerning learning English as a foreign language[1].

Impact of blindness on cognitive functioning

Congenital blindness has a significant influence on the development of cognitive functions, which manifests itself especially during the first four years of a child's life (Czerwińska et al. 2014). According to studies concerned with particular aspects of cognitive functioning by blind children, it is between the ages of 11-13 that indicators of cognitive development in this group match those of their sighted peers (Mikołajczak-Matyja 2008). Blind individuals catch up with their peers thanks to compensatory mechanisms, such as the skill to apply tactile strategies

1 Due to the objectives of this paper and the limitations of space, we do not deal with the impact of emotional and motivational factors on the learning process in blind individuals. Valuable information on these factors can be obtained from the publication by M. Jedynak (2015).

of exploring spatial objects and interpreting especially adapted graphic materials, or the skill to obtain information about the environment on the basis of auditory clues. The reason why this occurs at the stage of early adolescence is that developing such compensatory mechanisms requires effortful training and long-term support through education and rehabilitation.

The shaping of cognitive structures through observation based on the sense of touch and hearing is a slow process and the representations obtained in this way may not be as rich in detail as those obtained visually. For blind individuals, collecting bits of information on particular elements of the material world and on the socio-cultural setting in which one functions, and subsequent integrating all those bits in order to understand relations and dependences between them requires engaging greater attention and memory resources than in the case of sighted individuals. Because of that it takes longer and is more effort consuming (Czerwińska 2007, 2017). The character of sightless perception impacts directly on the quality of imagery attested in congenitally blind individuals. Such images, i.e. mental representations constructed on the basis of one's interactions with the world and memory processes are often schematic, fragmentary, or lacking important features of objects. Sometimes they may include inadequate features such as shape, proportions and part-whole relations (Kucharczyk 2015). In the case of strictly visual properties, such as colour, which are inaccessible for direct perception, compensatory images are often created on the basis of analogy, i.e. transferring tactile or auditory sensations from one object to another. The existence of gaps in knowledge and imagery attested in blind individuals indicates that compensating for the lack of vision by means of exploiting auditory and tactile stimuli is an extremely difficult task. For this task to be successfully completed, it is mandatory to provide a blind child with conditions enabling active interaction with the environment, so that a wide array of sensory (i.e. tactile and auditory) inputs is available. The surrounding environment should be organized in such a way as to facilitate collecting polysensory observations about objects, people and phenomena, additionally supplemented by verbal comments from caregivers providing details of currently explored objects, especially concerning such features, which cannot be perceived by a blind child. Frequent interactions with natural objects and their spatial models prevents the occurrence of inadequate imagery, which could be otherwise generalized into false beliefs and inadequate concepts. It has to be emphasized that although blind children can obtain information on the environment from verbal descriptions, it is direct interaction with objects and people that provides the optimum way of acquiring knowledge through experience and practical activities, which leads to creating complete and adequate mental representations of external objects. The scope and kind of messages communicated verbally by sighted caregivers can be insufficient (cf. Morash, McKerracher 2017), due to their subjective perspective and limitations of their own perception. On the other

hand, understanding verbal descriptions by a blind child will inevitably depend on its previous interactions with an object which is being described (Steele 2015).

Apart from natural objects and their three-dimensional models, a useful source of information on objects, people and phenomena can be provided by tactile graphics. However, as many researchers underscore (i.a. Vecchi et al. 2004; Heller et al. 2005; Wright 2008; Zebehazy, Wilton, 2014a, 2014b) for tactile graphics to become a basis for creating correct mental representations of real-world objects, it is necessary to be able to process and organize tactile sensations so that they give rise to such representations. The ability to interpret tactile graphics and to generalize information obtained from this source is not intuitive: on the contrary, it requires training, feedback and encouragement. Successful use of tactile graphics depends on manual skills, strategies of tactile exploration, cognitive abilities, familiarity with tactile drawing conventions (Wright 2008) and the inventory of concepts stored in memory (Aldrich, Sheppard 2000).

At the initial stage of learning to read tactile graphics, it is extremely difficult for a blind child to tie an illustration with a real-world object it depicts, due to significant discrepancies between tactile sensations induced by a three-dimensional object and its two-dimensional representation, and also due to lack of knowledge on how particular physical features of three-dimensional objects are conventionally presented in tactile pictures. Acquiring a skill to interpret tactile graphics is a gradual and time-consuming process, starting with comparing well-known natural objects with their pictorial representations. As was established in research carried out among blind adults, the speed of recognizing objects on tactile contour graphics is highly dependent on previous experience with using this kind of material. Blind individuals who have been accustomed to using tactile graphics in the course of school education needed significantly less time to identify objects in tactile representations than individuals whose experience has been scarce (Czerwińska 2008). Besides, it was demonstrated that the accuracy of identifying a tactile picture depends on access to semantic memory, similarly to what is happening when an object is identified visually (Heller et al. 2005). It is also indispensable to indicate the context and content of such a picture, either in the form of a title, caption, description, etc., or by providing an oral comment, or using both written and oral explanations at the same time. This prevents a blind individual from misinterpreting a shape, which may appear similar to various objects. The risk of such a misinterpretation is especially high when the difference in size between an object and its picture is large (Wright 2008). The usefulness of written auxiliary comments accompanying tactile graphics was noted by students with visual impairments themselves (Zebehazy, Wilton, 2014a).

Using tactile graphics offers an opportunity to obtain valuable information on objects, which can provide a basis for forming adequate imagery only insofar as the illustrations meet specific demands of tactile perception. The component parts of a picture should vary with respect to as many details of tactile properties

as possible, to ensure high contrast between them in order to facilitate perception and recognition of differences. Due to the limitations of tactile perception as compared with visual perception, it is necessary to reduce the number of elements, and consequently, the amount of information represented in a picture (cf. Prescher et al. 2017). The fundamental criterion for deciding which elements are essential and which are redundant in tactile graphics is the didactic aim for which the picture is used. It has to be noted that tactile graphics should be seen as a means to obtaining information which will be subsequently used for constructing adequate concepts and structured mental models of reality, corresponding with the material and socio-cultural organization of the world. What matters most in preparing tactile graphics then, is the educational message they are supposed to carry rather than a faithful representation of visual information in a form that is accessible to a blind individual.

Due to growing interest in exploiting various kinds of pictorial representations, such as photographs, pictures, drawings, comic strips, diagrams, graphs, maps, etc. for educational purposes, the problems of tactile graphics have become subject of research. It has to be however noted that most studies focus on the advantages of particular techniques of producing tactile graphics, on employing modern technology to obtain high quality typhlo-pictures, or on assessing the correctness and usefulness of design. The problems related to the specific character of blind individuals' cognition, i.e. to the user side of tactile graphics still remain relatively unexplored. More specifically, it can be observed that:

- there are no studies explaining the strategies of reading tactile graphics typically applied by students who show remarkable skills in this respect;
- no comprehensive account of students' needs is available related to receiving instruction from teachers' on how to optimize strategies for reading pictorial representations, etc.

It should be kept in mind that graphic materials are used in a number of standard psychological tests for assessing the level of cognitive abilities. In the case of blind individuals who are unable to make use of visual materials and aids, it is a common practice to choose only verbal tasks out of the whole battery of tests used to assess intelligence. A number of studies have tried to establish whether results obtained by blind children in verbal components of the Wechsler Intelligence Scale for Children (WISC), the norms of which were set on the basis of a sighted population performance, will be lower or higher than average. As has been found out, children with visual impairment typically score fewer points than average in tasks testing comprehension, analogical reasoning and vocabulary. This is believed to be tied to the inability to use visual clues in school education or to consolidate information by repeated spontaneous observation of the environment. The blind population outperformed the sighted population in subtests for verbal working memory, such as subtest on sequences of numbers, which can be explained by the fact that blind individuals are well trained in remembering information necessary for their

effective and safe functioning in every-day situations, for instance remembering landmarks on the way to a destination (cf. Morash, McKerracher 2017). Until recently, such a selective way of measuring cognitive abilities of blind children was considered a valuable source of information on their development, nowadays, however, it is claimed that semantic and conceptual representations develop differently in blind and in sighted individuals, therefore the reliability of verbal subtests, especially those based on semantic knowledge, raises serious objections as an assessment tool applied to blind children and adolescents (Morash, McKerracher 2017). Problems with a reliable assessment of intellectual abilities of blind students contribute to overall difficulties in making a holistic diagnosis concerning special educational needs of blind children. In the long run, this can increase the risk of their encountering various kinds of problems in education.

The above-average scores attested in blind individuals' working memory tests are corroborated by other forms of tests checking memorization of all kinds of information by blind children, adolescents and adults. One of the experimental studies involved remembering a long list of words played from a recording. Then, on recollecting these words, participants were asked to say if a word was read out by a male or female voice. Adults with visual impairments obtained excellent scores in remembering the voice pitch, whereas for sighted individuals remembering the properties of the reading voice posed a problem (Pring, Painter 2002). In autobiographic memory tests blind individuals showed very accurate memories as regards personal semantic memory (Pring, Goddard 2003). Observation of school practice also indicates that blind students excel in tasks involving memorizing, such as learning to use braille for reading and writing. The exact causes of the advantage of blind students over sighted students in memory tasks have not been thoroughly investigated so far, nor have specific guidelines for teachers been developed on how to make use of this strong side of blind students functioning in didactic work. Analyzing potential causes of high memory efficiency in blind individuals, Linda Pring (2008) points to the link between memory and auditory attention. Thus, due to greater attention devoted to auditory material, it can be available for exact reproduction for a longer time. This memorization strategy is clearly not favoured by sighted people. Efficient auditory processing involving good speech recognition in a loud environment, frequent interest in music and other skills relying on auditory perception can be also tied to the need to faithfully reproduce information which has been memorized (Pring, Ockelford 2006).

The unusual memory capacity can be helpful in the process of learning, however, remembering and reproducing information is not synonymous with understanding and ability to use information adequately in various contexts. It has to be noted that there is a high risk of verbalism among the blind, i.e. using information stored in memory without being able to link this information to any kind of direct sensory experience. Possessing such a passive inventory of data may in fact hinder information processing and appropriate organization of knowledge resources.

When designing the teaching-learning process, the instructor should rely both on the strong sides of blind students' functioning, such as auditory attention, memory, mental spatial imaging, and to minimize the negative impact of visual impairment on the development of cognitive processes, including the impact of fragmentary images, difficulties in acquiring natural concepts, the risk of verbalism and other.

Teachers working with students affected by visual disabilities have to carefully and constantly monitor their students' progress and difficulties, since not all dependences between congenital blindness and learning performance have been thoroughly examined, or, in some cases, contradictory results were obtained. For example, the development of Theory of Mind (ToM), i.e. the ability to draw inferences about other people's beliefs, intentions and emotions and to anticipate one's own and others' actions, is relatively unexplored in blind individuals in comparison to the typically developing population. Many researchers (i.a. Peterson et al. 2000; Pring 2008; Szubielska 2012) note that the development of ToM is delayed in the majority of blind children up to about the age of 12. Such a delay can hinder successful completion of school tasks due to inability to understand the teacher's instructions. Besides, successful functioning in social interactions can also be affected, as it inevitably involves imagination and representing mental states of others, in which blind children may display problems in adjusting learned behaviours to current situations.

Continuing research on the various aspects of the cognitive functioning of blind adolescents and children is of key importance for the school practice, since results obtained in such research help to identify a student's strong sides and potential areas of difficulties, in this way facilitating the adjustment of the education process to specific needs of an individual.

Blindness and the teaching-learning of a foreign language

In accordance with the current pedagogical trend to focus on the learner and his/her cognitive abilities, foreign language didactics assumes the perspective on learning as a set of mental operations. Every learning process is thus a cognitive process, and it can also be stated that the reverse is true: in some sense every cognitive process is a learning process (Dakowska 2001: 16), so learning and cognition are in fact treated as inseparable.

Let us briefly present some fundamental notions put forward by the cognitive approach to foreign language learning. Scholars working within this paradigm emphasize three aspects of human cognitive functioning, namely its intentionality, the role of interactions with the natural and social environment, and the fact that information is always processed in some contexts. In fact, it is a misconception to think about "information" in terms of abstract units, since information is always stored in chunks organized according to some principles, e.g. by chronology, in the form of scripts or scenarios, or by properties, in the form of categories.

The cognitive paradigm of foreign language learning has thus rejected the once widespread view that acquiring or learning a second language is an autonomous process, i.e. that it is independent of other cognitive abilities or faculties, arguing instead that language learning should be seen as a "bottom-up, exemplar-based and usage-oriented" process (Pütz, Sicola 2010: 1). This explains why a greater role in language learning is attributed to the ability to process information adequately to situational context than to the ability to memorize structures by heart, which as pointed out in the previous section, is an ability in which blind students outperform their sighted peers.

Information processing, which constitutes the core of cognition, is taken to involve such subsystems as perception, attention, memory, planning, anticipation and retrospection (Dakowska 2001: 20). The involvement of the various cognitive subsystems implies that foreign language learning is subject to the same constraints as other cognitive processes. Such constraints are due to the fact that human cognitive resources are finite and can be utilized for a limited number of tasks at a limited time. The question of how to manage the allocation of the cognitive resources in the learning process is of vital importance to researchers and teachers alike. This question is intrinsically linked to another aspect of foreign language learning underscored in the cognitive approach, namely, its usage-orientedness, which means that language is primarily seen as a tool of communication rather an abstract system of rules and an inventory of structures.

Much as it is uncontroversial and intuitively plausible to say that the goal of foreign language learning is to develop communicative skills in that language and that for this process to be effective it is necessary to make the most of cognitive resources available to the learner, a specific understanding of "communicative skills" and "making the most of cognitive resources" will depend on what one believes to be a psychologically adequate model of communication. The model traditionally upheld in linguistics is that of language as a code, in which the speaker encodes his/her communicative intention into an utterance and the hearer decodes it into a mental representation. Despite its obvious appeal, the code model does not however seem to do justice to a crucial component of human communication, i.e. to inferential processes which operate on the output of decoding. To illustrate the differences between decoding and inference, consider the following example: Mary and John are walking and when he stops to answer a text message on his mobile phone she says to him "It's raining". The decoded component of Mary's message is that it is raining at the place where they are walking. It has to be noted that most probably this component does not communicate anything to John, who already knows that it is raining. It appears then that what makes Mary's utterance an act of genuine as opposed to spurious communication is the inference that John makes on the basis of the decoded component, namely, that she wants him to move on, or that she is unhappy about him texting someone during the walk, or a similar conclusion along these lines.

A model of communication that gives due recognition to its inferential component and is at the same time rooted in cognition is Relevance Theory (Sperber, Wilson 1986/95; Wilson, Sperber 2004). This model also advances claims about principles behind selecting tasks to which cognitive resources are allocated in information processing, which, as has been mentioned, is of key importance in successful learning. Returning to the example above, what has to be explained about the allocation of cognitive resources in John's processing Mary's utterance is why he makes the inference to the effect that Mary wants him to walk on, rather than, say, an inference that the rain will water flowers in their garden. Note that each of these inferences requires retrieving different assumptions from the long-term memory, and focusing attention on different elements of the environment.

The explanation offered by Relevance Theory is based on the assumption that the processing of information is oriented towards maximizing relevance, i.e. obtaining maximum cognitive benefits at a justifiable processing effort. Cognitive benefits are improvements in one's representation of the world and processing effort is the expenditure of energy an organism has to make for its activities. Such a tendency towards maximizing cognitive efficiency is believed to have developed in the course of evolution, and as Wilson and Sperber claim, it governs the operation of all cognitive mechanisms:

> the human cognitive system has developed in such a way that our perceptual mechanisms tend automatically to pick out potentially relevant stimuli, our memory retrieval mechanisms tend automatically to activate potentially relevant assumptions, and our inferential mechanisms tend spontaneously to process them in the most productive way (Wilson and Sperber 2004: 610).

The reason why John focuses attention on Mary's getting wet and infers that she wants him to walk home is thus that this inference ensures the optimal balance between processing effort and cognitive gains. The latter may include the assumption that Mary does not like walking in the rain, which John may add to his long-term memory and use in the future. It has to be noted that John's inference is not merely a guess – it is the one that Mary has manifestly intended him to draw. Since speakers predict which inferences will be optimally relevant to hearers, and hearers tacitly assume that the inferences they draw are those intended by speakers, communication heavily relies on mind-reading abilities. Therefore, the Theory of Mind is an indispensable mental faculty without which inferential communication cannot take place.

As argued by Jodłowiec (2010), the general postulates about human communication and information processing put forward in the relevance-theoretic framework, such as that the crucial component of human communication is inferential, that communication involves mind-reading, and that search for relevance governs the allocation of cognitive resources in information processing, are applicable to

foreign language learning situations, which makes this theory a suitable tool for explaining what is needed – from the cognitive point of view – to make learning effective[2]. In what follows we shall elucidate practical implications that this theory may have for learning foreign languages by blind students.

To start with, it needs to be emphasized that learning a foreign language should not be primarily seen as a challenge to a blind student, who may be put at a disadvantage due to his/her specific cognitive functioning, as discussed in the previous section. Foreign language classes should also be treated as an opportunity to lessen differences between sighted and blind students with respect to the content of mental representations exploited in communication in that language. For this effect to take place, however, the material taught to blind students must offer enough cognitive benefits to attract their attention and ensure some relevant output.

As predicted by the studies on blind individuals' auditory perception and attention, in processing auditory input in a foreign language class, e.g. listening to a recording, such input may be interpreted by blind students as offering more cognitive benefits than it was actually intended by authors of the exercise. For example, when a recording featured loud sounds of steps to indicate that someone was approaching the scene of a conversation, a blind girl listening to that recording asked the teacher why the person who was walking wore high-heel shoes. The exaggeratedly loud sound of steps was only intended to attract the attention of sighted students, who could have easily missed that clue, but for a blind student trained to make the most of auditory clues, the peculiar sound and manner of walking was a salient enough stimulus to be treated as relevant. In this case, the blind student's allocation of attention turned out not to yield expected effects and distracted her from the line of processing which was intended to bring about cognitive benefits.

Due to the widespread use of visual materials in foreign language teaching, either in the form of pictorial representations, or as verbal descriptions of visual scenes, an opposite situation can be expected to occur more often, i.e. that a blind learner will fail to allocate his/her cognitive resources in a way predicted by authors of a task and will therefore fail to obtain intended cognitive benefits. The effect of such a failure may be that the student will have a diminished chance of acquiring some lexical item or grammatical structure in the foreign language, or s/he will miss an opportunity to enhance general knowledge. Naturally, this effect will not occur automatically any time visual information is encountered by a blind student. The risk of failing to obtain cognitive benefits in a way intended by authors of learning materials depends on a number of factors, including the complexity of a task (cf. the notion of processing effort introduced above), and the amount of information that has to be inferred rather than simply decoded on the basis of visual descriptions,

2 For an overview of second language learning research based on Relevance Theory see Jodłowiec (2010).

which may require high flexibility in retrieving information from memory and combining it with what is included in a description. Let us illustrate these problems by means of three examples drawn from a coursebook for Polish students preparing for the extended level *matura* examination.[3]

> 1. It was the 24th of March, Bill's twenty-fifth birthday. During his lunch hour, instead of going to the staff canteen as usual, he went outside for a breath of fresh air. Bill was a customer service advisor for a successful multinational telecommunications company […]. On a battered bookcase outside a charity shop, a book caught his eye. On the grubby cover were large white letters on bright green squares. Leaves and stems writhed around the letters, which ran vertically down the page spelling out the words USEFUL WORK VERSUS USELESS TOLL. (The text "Useful work?")

The part posing a potential challenge for a blind student is the description of the book cover that attracted the protagonist's attention. This description is relatively long, including details of colours and decorations used on the cover, which in fact do not have any significance beyond encouraging the inference that the cover design was old-fashioned. A blind student may spend much effort on processing this fragment, possibly expecting it to be related to the title of the book and/or to contribute to the relevance of the story presented in the text. Since this is not the case, the student's expectations will not be met, which might impact negatively on understanding the whole text and solving tasks based on it.

> 2. Review of Terry Pratchett's book *Maskerade*: The action-packed hilarious novel is inspired by the romantic mystery "The Phantom of the Opera". The complex plot centres on Agnes Nitt, a plump country girl with a magical signing voice. Pursuit by two witches who want to recruit her, Agnes flees to Ankh-Morpork Opera House. She dreams of becoming a great opera singer but to her dismay, she ends up singing arias from the chorus at the back of the stage while a slimmer soprano lip-synchs to her vocals in the spotlight.

As the review suggests, Pratchett's book is a satire on modern society that values looks more than the singing talent. This information can be obtained inferentially by combining various bits given in the text (the plump girl vs. a slimmer soprano) with background information about current trends in pop culture. As a comprehension task connected with this text students are expected to link it with the description "a protagonist who fails to achieve her ambition". It can be hypothesized that due to

3 The examples are taken from Longman repetytorium maturalne poziom rozszerzony by Marta Umińska, Bob Hastings, Dominika Chandler, Rod Fricker and Beata Trapnell, units on culture, work and family life.

a number of explicit clues offered by the text – apart from contrasting "plump" with "slim" it mentions the protagonist's feeling of "dismay", the intended inferences are not difficult to draw. This text can be thus seen as a valuable source of information to blind students, who may improve their representation of the world by adding to it some beliefs on visual values in modern culture and society. These beliefs may facilitate the operation of cognitive processes in subsequent communicative situations.

The third example is a fragment of a longer text describing wedding traditions in various cultures. It starts with comparing English to Scottish weddings:

> 3. But there is one obvious difference: you can see the bridegroom's legs! In many Scottish weddings, men wear traditional Highland dress including a kilt instead of trousers. Another difference is the music. Often, a piper plays the bagpipes as the bride and groom leave the church or registry office.

Saying that in Scottish weddings you can see the groom's legs may be seen as a source of humour, which originates from the clash between this utterance and standard expectations that people wear formal attires in weddings. Again, it can be hypothesized that this background information can be effortlessly accessed by both sighted and blind students, even though there may be a risk that blind students will not immediately understand "see the bridegroom's legs" as "naked legs" – an inference underlying the humorous interpretation mentioned above, as for a sighted person it is obvious that the only reason why one would mention "seeing legs" is that the groom is not wearing trousers. Still, there is a good chance that the next sentence – about the kilt – will prompt this inference, thereby enhancing a blind student's mental representation of wedding attires in various cultures, which among sighted students is typically acquired through visual perception.

In the analysis presented above we have offered some predictions of how blind students may respond to verbal descriptions containing visual elements, highlighting potential challenges and also pointing to possible benefits that may be drawn from studying these texts in the class. We underscored the interdependence of learning a foreign language with cognitive processes leading to obtaining a relevant interpretation of utterances and texts constituting teaching materials. It follows from our approach that the cognitive processes involved in obtaining such interpretations can be also facilitated by additional instructions offered by support teachers typically working with blind students. Whenever a support teacher predicts that difficulties may occur with allocating cognitive resources in such a way that a relevant output will be obtained, he/she may intervene by providing background information needed as a clue to direct the processes to the intended path. We believe that this kind of intervention in foreign language classes will be beneficial from the point of view of language learning and general cognitive development of blind

students, hoping that the examples discussed provided a convincing illustration of this claim.

Concluding remarks

The result of many experimental studies on the cognitive functioning of blind individuals indicate that the differences between this population and sighted individuals may be significant in terms of cognitive processes and mental representations, at least up to the age of adolescence but, as is often attested, also in adulthood. The objective of this paper was to address the practical implications of the specific functioning of blind individuals for the process of learning a foreign language. As was pointed out, to describe such implications adequately, it is necessary to adopt a cognitive perspective on learning, with language being viewed as a tool of communication and social interactions. We observed that the differences in mental representations between the sighted and blind students may result in different processing paths undertaken by the two groups, which may lead to blind students obtaining outputs of processing not necessarily corresponding with the intention of authors of teaching materials. This may happen if texts heavily rely on descriptions of visual elements, and the risk is greater if such visual elements are supposed to give rise to complex inferences. However, as we argued, the risk can be diminished by interventions carried out by support teachers, who may direct students' attention to relevant aspects of texts or provide missing information, thereby turning a learning challenge into a cognitive benefit contributing to successful language learning and general development. Therefore it appears advisable to increase the awareness of the specificity of cognitive functioning by blind individuals. This concerns all aspects of school work in which this functioning may manifest itself, including the interpretation of tactile graphics, the use of auditory stimuli and other issues which deserve attention and should be addressed in future research.

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FUNKCJONOWANIE POZNAWCZE UCZNIA NIEWIDOMEGO NA LEKCJACH JĘZYKA OBCEGO

Streszczenie: Niniejszy artykuł poświęcony jest specyfice funkcjonowania poznawczego niewidomych dzieci i nastolatków w zakresie postrzegania, uwagi, pamięci, przetwarzania informacji oraz Teorii Umysłu. Poruszone jest też zagadnienie jej wpływu na naukę języków obcych. Omówione są badania empiryczne dotyczące wpływu niepełnosprawności wzrokowej na funkcje poznawcze, a proces nauki języka obcego jest przedstawiony z punktu widzenia teorii, według których jest on wynikiem działań poznawczych zorientowanych na rozwijanie kompetencji komunikacyjnych. Sytuacja niewidomego ucznia na lekcji języka obcego jest omówiona zarówno z perspektywy trudności stojących przed niewidzącą osobą, jak i z punktu widzenia możliwości zmniejszenia luki pomiędzy osobami widzącymi i niewidzącymi dzięki treściom zawartym w podręcznikach do nauki języków obcych.

Słowa kluczowe: niepełnosprawość wzrokowa, niewidomy, funkcje poznawcze, nauka języków obcych.

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