

Research in Education and Rehabilitation 2019; 2(1): 30-37.

VISUAL PERCEPTION IN CHILDREN WITH MILD INTELLECTUAL DISABILITIES

VIZUELNA PERCEPCIJA KOD DJECE SA BLAŽIM INTELEKTUALNIM TEŠKOĆAMA

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Original scientific articles

ABSTRACT

Visual impairment is a major problem for every individual, considering that visual information makes up about 90% of the data arriving into the cerebral cortex via all human sensory organs. The human learns through visual imitation, which is why it is very important having good visual perception to facilitate overall development.

The aim of this study is to examine the level of school competence/readiness of students with mild intellectual disabilities, and to determine whether there are differences in visual perception abilities between students with mild intellectual disabilities who attended preschool education and students with mild intellectual disabilities who did not attend preschool education. The study was conducted on a sample of 60 students with mild intellectual disabilities, both genders were included, first graders and second graders. The sample of respondents was divided into two sub-samples: students with mild intellectual disabilities who attended preschool education (N = 25) and students with mild intellectual disabilities who did not attend preschool education (N = 35). The study was conducted using the DABERON-2 test (Danzer, Frances, Gerber, Lyons, Voress, 1991). The test was designed to test ten areas, but for the purposes of this research, a part of the test related to visual perception area testing was isolated, and this part involves examining visual perception through the ability to map the same figures. The maximum number of points that can be achieved in this area is 10. The results were presented by descriptive statistics, and the differences between the respondents were calculated by t-test. On the summary variable of the "Visual Perception" area, students with mild intellectual disabilities who did not attend preschool education achieved an average score of 7.37, with a standard deviation of 2.43, while the other group of students with the same disabilities, who attended preschool education, achieved an average score of 5.84 with a standard deviation of 3.09. The results of the t-test did not show a statistically significant difference in the level of school competence/readiness of students with mild intellectual disabilities in relation to the attendance of preschool education; in the area of "Visual Perception" (t = -2,144; p = 0,169).

Keywords: students with mild intellectual disabilities, visual perception, preschool education

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SAŽETAK

Oštećenje vida za svaku osobu predstavlja veliki problem, uzmemo li u obzir da vizuelna informacija čini oko 90% podataka, koji dolaze u koru velikog mozga preko svih čovjekovih osjetilnih organa. Čovjek uči kroz vizuelnu imitaciju, te je zbog toga jako važno da imamo dobru vizuelnu percepciju kako bi se olakšao ukupan razvoj.

Cilj rada je ispitati nivo školske spremnosti učenika sa blažim intelektualnim teškoćama, te utvrditi da li postoje razlike u sposobnostima vizuelne percepcije između učenika koji su bili obuhvaćeni predškolskim odgojem i učenika koji to nisu. Istraživanje je sprovedeno na uzorku od 60 učenika s blažim intelektualnim teškoćama, oba spola, I i II razreda. Uzorak ispitanika podjeljen je na dva subuzorka: učenici s blažim intelektualnim teškoćama koji su bili obuhvaćeni predškolskim odgojem (N=25) i učenici koji nisu obuhvaćeni istim (N=35). Istraživanje je provedeno testom DABERON-2 (Danzer, Frances Gerber, Lyons i Voress, 1991). Test je konstruisan za ispitivanje deset područja, međutim za potrebe ovog istraživanja izdvojen je dio testa koji se odnosi na ispitivanje područja- vizuelna percepcija, koji podrazumjeva ispitivanje vizualne percepcije kroz mogućnost preslikavanja istih figura. Maksimalan broj bodova koji se može postići na ovom području je 10.

Rezultati su predstavljeni deskriptivnom statistikom, a razlike ispitanika izračunate su t-testom. Na sumarnoj varijabli područja „Vizuelna percepcija“, učenici sa blagim intelektualnim teškoćama koji nisu bili obuhvaćeni predškolskim vidom odgoja i obrazovanja postigli su prosječan rezultat koji iznosi 7,37, uz standardnu devijaciju od 2,43, dok je druga skupina učenika, sa istim teškoćama, koji su bili obuhvaćeni predškolskim vidom odgoja i obrazovanja ostvarili prosječan rezultat od 5,84 uz standardnu devijaciju 3,09. Reultati t-testa nisu pokazali statistički signifikantnu razliku u nivou školske spremnosti učenika sa blažim intelektualnim teškoćama u odnosu na obuhvaćenost predškolskim vidom odgoja i obrazovanja na području „Vizualna percepcija“(t=-2,144; p=0,169).

Ključne riječi: učenici s blažim intelektualnim teškoćam, vizuelna percepcija, predškolski odgoj

INTRODUCTION

Intellectual disabilities (ID) are characterized by impaired intellectual functioning and adaptive behaviour that occur in childhood. Diagnostic criteria for ID include an intelligence coefficient (IQ) below 70, difficulties in the area of adaptive behaviour, and the occurrence before the age of 18[1]. Students with mild intellectual disabilities differ very little in most respects from students whose IQ ranges from 70-85, who in the past have been called "slow learners" or "low-achieving students"[2]. Basic characteristics of persons with intellectual disabilities[3] in relation to IQ, developmental age, cognitive development, social development, emotional development and personality development are shown in Table 1.

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Table 1. Characteristics of persons with intellectual disabilities[3]

IQ	50-70
Developmental age	7-12
Cognitive development	- logical thinking, - learns from examples and through his/her own experiences, - can read, write and count, - thinks about specific situations.
Social development	- dependent on the opinions of others, - accepts social rules, - shows loyalty to "important people", - wants to belong to a specific group.
Emotional development	- developed sense of self-worth, - takes care of loved ones/family/friends, - cares about the future, - emotions: joy, sorrow, love, hate, - trust, distrust, empathy; less developed emotions: conscience, sexual love, - aggression directed at specific persons.
Personality development	- problems of personal autonomy, - "self" is dependent, - problems with the internalization of the "super-ego".

The role of eyesight in the development of a child and the integration of information we receive through other senses explains the negative effects of visual impairment on almost all developmental domains. If not corrected in a timely manner, visual impairment can have a negative impact on achievements in various areas of daily functioning[4], which is even more pronounced in the case of children with intellectual disabilities[4].

Reduced visual acuity and visual field tantrums are explained by damage to the primary visual pathways. However, brain damage can also affect multiple visual functions, such as shape recognition, motion perception, or orientation in space. More visual features can be damaged without any change in visual acuity[5].

Visual perception is not only about the possibility of seeing things, it has elements of understanding, or at least an association with the meaning of what is seen. As a result, the impulses (information) that reach the brain are linked to the memory of the individual's past experiences and stimuli. In this way we study our outside world, using past experiences combined with new experiences, thus enhancing our knowledge[6]. Visual perception plays an important and integrating role in the development of cognitive and perceptual-motor skills[7].

The difficulties of visual perception negatively affect a person's independence, their ability to learn new actions, to maintain an upright balance of the body, to accurately observe space or manipulate objects[8].

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Aim of the research/study

The aim of this study is to examine whether there are differences between students with mild intellectual disabilities who attended preschool education and those with the same disabilities who did not attend preschool education; in the area of "Visual Perception".

Methods of research

A total of 60 students with mild intellectual disabilities participated in the study, 35 students (N-35) attended preschool education and 25 students (N = 25) did not attend preschool education. First and second grade students of both genders of primary school were included in the research. The study was conducted using the DABERON-2 test by Danzer, Frances, Gerber, Lyons, Voress (1991)[9]. The test is used to assess school competence/readiness. It consists of 122 variables examining the following areas: body parts, colour concept, concept of numbers, suggestions, following instructions, plural, general knowledge, visual perception, motor development, categories. For the purposes of this study, only one part of the test was used - the "Visual Perception" area, which included the examination of visual perception through the ability to map the same figures.

The maximum number of points that can be scored or achieved in this area is 10. Answers on the DABERON-2 test are marked as (R) - right, (W) - wrong, (N) - no answer, (I) - inadequate answer. In most cases, the answer is right or wrong, and the child scores/achieves a point only for correct answers, so the correct answer is 1 point and the incorrect one is no points (0). The study was conducted individually with each respondent, at different time periods. The average test duration is about 20 minutes. Due to the low percentage of children enrolled in preschool education, the survey was conducted in several schools in Bosnia and Herzegovina. The surveyed schools were: Primary School "Safet-beg Bašagić", Primary School "Ivan Goran Kovačić", and Primary School "Musa Ćazim Ćatić" - in the Gradačac area. Schools in Brčko District area: First Primary School and Second Primary School in Brčko, Seventh Primary School in Gornji Rahić, Eighth Primary School in Brka and Ninth Primary School in Maoča. Furthermore included are: Special Primary and High School "Đorđe Natošević" in the Prijedor area, and Public Institution Centre for Children and Youth with Special Needs "Los Rosales" in Mostar.

RESULTS

Table 1 shows the results of the percentage representation of correct/right (R) and incorrect/wrong (W) answers of students with mild intellectual disabilities who did not attend preschool education; in the area of "Visual Perception". This area consists of 10 variables.

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Table 1. Percentage representation of students with mild intellectual disabilities who did not attend preschool education; in the area of "Visual Perception".

Number	Variable	NO		YES	
		F	%	F	%
95	Circle (something) (3 years old)	2	5,7	33	94,3
96	Cross (something) (4-4.5 years old)	2	5,7	33	94,3
97	Square (4.5 years old)	6	17,1	29	82,9
98	X (4-5 years old)	7	20,0	28	80,0
99	Triangle (5 years old)	10	58,6	25	71,4
100	Three crossed lines (6 years old)	22	62,9	13	37,1
101	3 blocks of the pyramid (3 years old)	5	14,3	30	85,7
102	5 blocks of a train (3 years old)	7	20,0	28	80,0
103	6 blocks of the pyramid (4 years old)	13	37,1	22	62,9
104	10 blocks of the pyramid (5 years old)	18	51,4	17	48,6

Table 1 shows that respondents achieved the highest number of correct answers on the variables „Circle (something) (3 years old)“ and „Cross (something) (4-4.5 years old)“ with 33 correct answers or 94.3%. Also, a great number of correct answers, 30 in total, was achieved on the variable „3 blocks of the pyramid (3 years old)“, where the percentage of correct answers is 85.7%. On the variable „Square (4.5 years old)“ the number of correct answers is 29 or 82.9%. In the area of "Visual Perception", students with mild intellectual disabilities who did not attend preschool education, on the variable „10 blocks of the pyramid (5 years old)“ , achieved a total of 17 correct answers (48.6%), while on the variable „Three crossed lines (6 years old)“, they achieved 13 correct answers or 37.1%.

Table 2. Percentage representation of students with mild intellectual disabilities who attended preschool education; in the area of "Visual Perception"

Number	Variable	NO		YES	
		f	%	F	%
95	Circle (something) (3 years old)	7	28,0	18	72,0
96	Cross (something) (4-4.5 years old)	8	32,0	17	68,0
97	Square (4.5 years old)	6	24,0	19	76,0
98	X (4-5 years old)	10	40,0	15	60,0
99	Triangle (5 years old)	8	32,0	17	68,0
100	Three crossed lines (6 years old)	17	68,0	8	32,0
101	3 blocks of the pyramid (3 years old)	6	24,0	19	76,0
102	5 blocks of a train (3 years old)	7	28,0	18	72,0
103	6 blocks of the pyramid (4 years old)	16	64,0	9	36,0
104	10 blocks of the pyramid (5 years old)	19	76,0	6	24,0

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Table 2 shows that the respondents achieved the highest number of correct answers on the variables „Square (4.5 years old)“ and „3 blocks of the pyramid (3 years old)“. On these variables, the number of correct answers is 19 out of a possible 25, while the percentage representation of correct answers is 76.0%. The number of correct answers on the variables „Circle (something) (3 years old)“ and „5 blocks of a train (3 years old)“ is 18, or 72,0%. Also, we have two variables „Cross (something) (4-4.5 years old)“ and „Triangle (5 years old)“ with 17 correct answers, that is, the percentage of correct answers is 68.0%. Variables with a percentage lower than 50%, or variables with the least number of correct answers in the "Visual Perception" area are: „6 blocks of the pyramid (4 years old)“ with 9 correct answers (36.0%), the variable „Three crossed lines (6 years old)“ where the number of correct answers is 8 (32.0%) and the variable „10 blocks of the pyramid (5 years old)“ with the lowest number of correct answers, 6 in total, and the percentage representation of correct answers on this variable is 24.0%. Students with mild intellectual disabilities who attended preschool education achieved worse results in the area of "Visual Perception" than students with the same disabilities who were not covered by the preschool aspect of education. However, it should be emphasized that despite the differences in the results achieved, there is no statistically significant difference.

Table 3. Descriptive statistics of the summary variable for students with mild intellectual disabilities in relation to the attendance of preschool education

Area	**Kindergarten**	**N**	**AM**	**SD**
Visual perception	YES	25	5,84	3,09
	NO	35	7,37	2,43

Based on the results presented in Table 3, it is evident that on the summary variable of the area "Visual Perception", better results are achieved by students with mild intellectual disabilities who did not attend preschool education (AM = 7.3), compared to students with the same disabilities who did attend preschool education (AM = 5.8). The standard deviation value for the respondents who did not attend preschool education is (SD = 2.4), and for the respondents who did attend preschool education, the standard deviation is (SD = 3.0).

Table 4. Differences in abilities of visual perception of students with mild intellectual disabilities in relation to the attendance of preschool education

	F	**p**	**t**	**df**
Visual perception	**1,938**	**0,169**	**-2,144**	**58**

The results of the t-test, shown in Table 4, showed no statistically significant difference in the level of visual perception of students with mild intellectual disabilities in relation to the attendance of preschool education (t = -2,144; p = 0,169).

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DISCUSSION

Visual perception is preserved if the subject/respondent successfully names the objects, shows the named objects, and describes their function or use. Thus, visual perception proceeds continuously from registering simple characteristics of visual stimuli such as luminance, angle, length, curvature, movement, size, etc., to perception of wholes/units, spatial relationships and recognition[10]. Visual perception is the basis for the development of many cognitive functions.Thanks to visual perception and its simultaneity, the human receives information from the outside world. Visual perception is one of the basic cognitive functions, which means recognizing and discriminating stimuli, as well as interpreting them, and linking received information to previous experience[11]. If a child with intellectual disability cannot learn something or perform an activity, or does so with great difficulty, it is generally thought to be due to a problem with its mental function, and it is rarely associated with visual impairment. The neglect of the fact that visual impairment can be a potential cause of difficulties for children with intellectual difficulties in the process of acquiring abilities and skills acquisition, calls into question rehabilitation and educational programs based on the assumption that there is no eyesight problem[12]. In our study in the area of "Visual Perception", the tasks were mainly about hand-eye coordination and outline of the same shapes. Based on the results obtained, we conclude that respondents with mild intellectual disabilities who did not attend preschool education achieved slightly better results than those with the same disabilities who attended preschool education, with the number of correct answers gradually decreasing as the complexity of the tasks the respondents were completing increased.

CONCLUSION

Based on the presented study results, we can conclude that there is a difference in visual perception abilities between students with mild intellectual disabilities who attended preschool education and those with the same disabilities who did not attend preschool education. Better results were achieved by students with mild intellectual disabilities who did not attend preschool education, which was contrary to what was expected. The reasons for this outcome are numerous, but one of them is the insufficient involvement of experts, that is, special educators and rehabilitators in preschool institutions. One of the reasons may also be the inadequate approach of the tutor/educator, in terms of insufficient knowledge of working methods with these children, which can create negative experiences for children with intellectual disabilities and, consequently, reduce their will and desire to work.

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