AJSP
المجلة العربية للنشر العلمي
الإصدار الخامس - العدد السادس والأربعون
تاريخ الإصدار: 2 – آب – 2022م
www.ajsp.net
ISSN: 2663-5798

"Nonverbal Abilities Based on Visual Perception in Children with Hearing Impairments and Cochlear Implant Recipients"

Researchers:

Dr. Abla Mahrez

University of ORAN2 "Mohamed Ben Ahmed",

ALGERIA

Prof. Adel M. Khodeir

College of Arts, University of Bahrain,

Kingdom of Bahrain

AJSP
المجلة العربية للنشر العلمي
الإصدار الخامس - العدد السادس والأربعون
تاريخ الإصدار: 2 – آب – 2022م
www.ajsp.net
ISSN: 2663-5798

Summary:

Thinking abilities are one of the most important interactive higher cognitive processes that develop and grow during childhood, which are affected by the child's physical, mental, and psychological conditions and peculiarities. Which combines and employs in the interaction and integration of all other processes, and the category of hearing-impaired children and cochlear implant carriers is considered among this sensitive category, which requires special care.

Therefore, our current study aimed to measure the nonverbal thinking and problem-solving abilities of this group of children, using the Naglieri Non Verbal Ability Test (NNAT) -- by studying four cases of schoolchildren aged eight and nine years, where the general results of the study showed that they suffer difficulties in non-verbal thinking abilities and problem solving, and the percentages of using different types of non-verbal thinking abilities vary among them, which has a negative impact on their academic performance and cognitive activity in general.

Keywords: Non-verbal thinking abilities - Visual perception - Hearing impairment - Ehildren with special needs - Hard of hearing and cochlear implant holders.

Introduction:

The category of hearing-impaired children is one of the most important groups in society that cannot be ignored. Childhood has a right that requires us to pay attention to it and provide everything that is appropriate for it to achieve proper growth in various aspects of personality. Hearing-impaired children are the ones who suffer from a deficiency in their hearing abilities compared to their peers, which oftentimes has negative effects on their psychological, emotional, and cognitive lives, as they find obstacles in communicating with others, whether at the family level or outside, which leads to the emergence of various problems that are reflected in forms of psychosocial mismatch.

The impact of hearing impairment on all cognitive, communicative, and personal mental functions in general increases as its severity augments. The hearing impaired with cochlear implants may make up for what he missed in training to complete his growth and development, especially given the age at which he was first diagnosed and received care, but despite that, the disability remains still. Its negative consequences and repercussions on cognitive functions in general and thinking, as it is a complex interactive function that requires the activation of several cortical brain regions that receive information mainly through the language channel, which calls for compensating for the deficiency in the hearing impaired by relying on non-verbal thinking abilities.

I. Theoretical aspect

1- The problem of the study:

The hearing impaired suffer from delays in the areas of academic achievement compared to their peers, especially in verbal language skills, such as oral and written expression, listening and reading. If someone is more than 2000 words old, a deaf person does not know more than 200 words, and without an organized linguistic education, the deaf child knows less than 25 words only, in addition to the lack of linguistic richness among the hearing impaired, as their language is characterized by being not rich (Al-Quraiti, 2004, p. 186), and their sentences are shorter and less complex, and it seems Their speech is slow, with an inappropriate tone, as they find it difficult to determine the pitch and tone of the voice, and their linguistic delay is due to the fact that they cannot hear the verbal and linguistic patterns and therefore not imitate them, and to the absence of any feedback from those around them regarding the sounds they make, and then They lack auditory and linguistic reinforcement, in addition to not obtaining sufficient auditory stimulation from others for their negative expectations about them. This means that they understand a lot more vocabulary than they use, learn concrete words easier than they learn abstract words, find it difficult to understand and use sentences with complex grammatical structure, and confuse many rules Simple grammar, such as pronouns, denoting nouns, interrogative tools, masculine and feminine, and adverbs of time and place.

Higher cognitive functions are affected by the extent of completeness and development of lower cognitive functions such as perception, memory, and learning, which are directly related to sensation as a base neurological mental function. About what we do when we think, as children practice from birth what Piaget called sensory-kinesthetic and pre-operational thinking in early childhood, then material thinking in late childhood, and finally abstract thinking in early adulthood. (Zahran, 2005)

So thinking is one of the cognitive functions that arise and develop according to what the person receives from his external surroundings through his sensory channels, and like other mental functions, it is affected by physical disabilities or defects that may affect any sense, but due to the flexibility of the work of the human mind and its lack of centralization in carrying out its various functions, it may make up for its impotence. It resorts to alternative mechanisms that compensate it, to complete its performance and practice its activities in a way that enables it to adapt to special situations, and here we must ask the main question of the study:

Do hearing-impaired children with cochlear implants have difficulties in non-verbal thinking and problem-solving abilities?

The following sub-questions fall under this general question:

Do hearing-impaired children with cochlear implants have difficulties completing the model?

Do hearing-impaired children with cochlear implants have difficulty thinking about the same?

Do hearing-impaired children with cochlear implants have difficulties with sequential thinking?

Do hearing-impaired children with cochlear implants suffer from difficulties in spatial representation?

2- Study hypotheses:

General hypothesis: Hearing impaired children with cochlear implants have difficulties in nonverbal thinking and problem-solving abilities.

Partial Hypotheses:

Hearing impaired children with cochlear implants have difficulties completing the pattern.

Hearing-impaired children with cochlear implants have difficulty thinking analogically.

Hearing impaired children with cochlear implants have difficulties with sequential thinking.

Hearing impaired children who have cochlear implants suffer from difficulties in spatial representation.

3- Hearing impairment:

Hearing disability means those problems that prevent the individual's hearing system from performing its functions or reduce the individual's ability to hear different sounds. (Malkawi, 2011, pp. 494-495)

3.1 Definition of a hard of hearing:

They are people who suffer from a hearing impairment or deficiency that does not allow them to respond normally to educational and social purposes except by using aids. (Hanafi, 2003)

We can limit the category of hearing-impaired children to the first three categories of hearing impairment, so that their hearing impairment is confined between (25 to less than 70 decibels), as they respond to audible speech in their surroundings, which indicates their awareness of what surrounds them, provided that their hearing abilities are compatible. and sound source.

3.2 Causes of hearing impairment:

• Genetic factors.

• Congenital malformations, whether in the eardrum, ossicles, cochlea, or ear pinna.

• Infection of the mother during pregnancy, especially German measles.

• Premature birth.

• Complications resulting from some difficult deliveries and complications that may occur during the birth process.

• Jaundice in the newborn, especially if it was in the first hours after birth or in the first three days.

• Increased secretions of wax in the ear, which leads to the closure of the auditory canal.

• Foreign bodies that are in the ear.

• Accidents, slaps, and punches on the ear.

• Infection of the child with some infectious diseases, such as acute and chronic otitis media.

• Prolonged exposure to noise, noise, and loud sounds. (Al-Mallah, 2016, pg. 4)

3.3 Problems of hearing-impaired children:

The hard of hearing child suffers from several difficulties because of his disability mentioned by "Abdul-Majid Abd al-Rahim", including:

- He feels distress when he sees others talking, and signs of anger appear on his face that remain inherent to him.

He misses some words and does not understand the meaning, and he may mix it with another meaning and respond to the situation with what he thinks he has heard.

If he speaks, fearing that his words will be out of place, then he breaks the words apart and does not complete them.

He cannot balance the pitch of his voice in different words, nor can he estimate the time intervals between words.

He may speed up sometimes and slow down at other times unnecessarily because his mind does not come up with the required words due to his lack of credit for them.

He feels that others are making fun of his way of speaking, so he looks at them in doubt or gets angry in an emotional way.

He is afraid to walk on the road because he does not hear the horns and cars coming behind him or speeding on his sides. (Photographs, 2010, pp. 144-145)

A study by Wiefferink et al, 2012 indicated that deaf children with cochlear implants have a significant impairment in social functioning compared to normal hearing children.

Hearing disability has a negative impact on various aspects of development, especially the social aspect due to the loss of language, which does not encourage these children to engage with others and interact with them, which results in depriving these children of acquiring the culture of the society in which they live and expressing their demands. Dealing in an appropriate manner in different social situations and interacting efficiently.

(Spencer & Marschark,2010) also indicated that hearing impairment leads to language poverty, which affects social, emotional, cognitive, and academic development, so we find the child's ability to communicate with others limited, as well as social skills, and then low self-esteem. (Metwally, 2019, pp. 69-70)

Accordingly, we can conclude that the hearing-impaired child suffers from many problems and difficulties in various aspects, whether psychological, emotional, social, cognitive, or academic ... which requires us to search for the most effective ways, strategies and ways to help overcome them.

ISSN: 2663-5798

4- The concept of thinking:

*COSTA (1985) defines thinking as the mental processing of sensory inputs with the aim of forming ideas, to perceive and judge sensory stimuli.

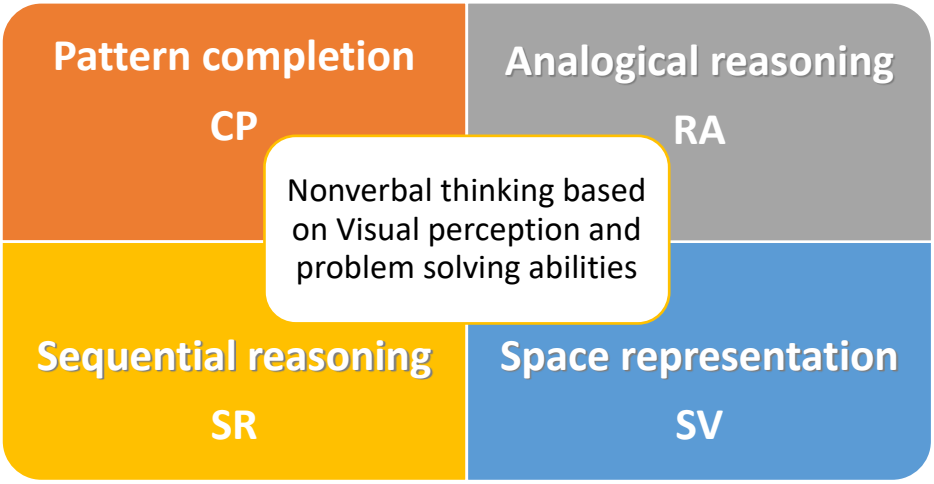
*While Barell (1991) defines it that in its simple sense it represents a series of mental activities that the brain performs when exposed to a stimulus after receiving it through one of the five senses, while in its broad sense it is a process of searching for meaning in a situation or experience.

*OSSGOOD (1997) defines it as an internal representation of external events and stimuli in the environment.

Accordingly, we conclude that the thinking process is a cognitive activity that works to give environmental stimuli meaning and significance through the cognitive structure, to help the individual adapt and adapt to the environmental conditions.

4.1 Visual perception thinking abilities:

- Figure 01: Nonverbal thinking based on visual perception and problem-solving abilities. (M. Ajd, 2018, 175 p.)



- **Figure 01: Nonverbal thinking based on Visual perception and problem-solving abilities. (M. Ajad, 2018, 175 p.)**

4.1.1 Pattern completion:

A function that allows the recovery of memory through a partial or incremental indicator, so that the person depends in determining his answer on the general orientation and various details to draw the missing part.

4.1.2 Analogical reasoning:

It usually consists in matching the previous case with the new similar case, to deduce the nature or aspects of the new case, and this requires the person to identify the logical relationships between the various geometric shapes according to their appearance.

4.1.3 Sequential reasoning:

It appears as a set of variable-sided graphics (look, content, idiomatic lines, etc...), depending on whether they move horizontally or vertically in the matrix.

We assume that the person understood the logic of the set (knowing the sequence of shapes) to apply it in the last line to finish it.

Solving this kind of thinking is essential (e.g. one must notice a white square changing with a shader square in another line or box) and consider many aspects of the drawing at the same time.

(14: Djouadi,2015.)

4.1.4 Space representation:

It is defined as the ability available to the individual to process spatial information in an environment to direct himself, and spatial representation allows to conjure up things in their absence, through internal images or multiply the process of perception of things to complete knowledge of things or identify them.

4.2 Concept of problem solving:

The term "problem solving" is used in psychology references in the sense of behaviors and intellectual processes directed to perform a task with mental and cognitive requirements, and the task may be solving an arithmetic problem, writing a poem, searching for a job, or designing a scientific experiment.

The researchers Krulik and Rudink (1980 krulik et rudnich) define the concept of "problem solving" as a thinking process in which the individual uses his previous acquired knowledge and skills, in order to respond to the requirements of an unfamiliar situation, and the response is by undertaking an action aimed at resolving contradiction, ambiguity or ambiguity What is contained in the situation, and the contradiction may be in the form of a lack of logical coherence between its parts, a gap or a defect in its components.

Schunk (1991) sees that the expression problem solving refers to the efforts of people to reach a goal that they do not have a ready-made solution to achieve. (Moawad, 2013: 05).

The problem-solving skill is a thinking process that requires mental effort that the individual exercises, when facing a strange situation characterized by lack of clarity and has no prior solution so that he employs his current experiences and knowledge, in order to reach the solution and achieve the goals he seeks. (Al-Atoum, 2005: 251).

II. Application side

5- Field procedures for the study

5.1- Study Methodology: In our study we have relied on the descriptive approach to suit its techniques with the goals and peculiarities of the study.

- Spatial boundaries: the original community of the study belongs to the elementary schools "Fadil Eleiwa" and "Ali Chaker" at the level of the municipality of Ouled Fayet, wilaya of Algiers.

Time limits: The study was conducted in the first trimester of the academic year 2020/2021.

5.2 Study Sample:

The study sample consisted of four primary school students of the third and fourth year, ranging in age from 8 and a half to 9 and a half years, and they were chosen intentionally according to a set of criteria. We note that all cases are shown in Table No. (01).

Table No. 01: Characteristics of the study sample.

Case	Age	Gender
01	9,5	Female
02	8	Male
03	9	Female
04	8,5	Male

5.3 Study tools:

- Researcher Naglieri Nonverbal Abilities Test (NNAT):

NNAT stands for Naglieri Non-Verbal Ability Test.

It is a thinking test, characterized by a quick and simple pass for primary, intermediate, and secondary school children, regardless of the child's cultural and social level and verbal abilities. This test is mainly based on the principle of similar matrices, and it allows an honest assessment of the skills or abilities of non-verbal thinking and problem solving.

Its clauses are carefully drawn up to attract the children's attention. They are very understandable, or almost without the need to explain them.

This test was standardized on a group of about 2,300 children (05-15 years), so this test is an important tool for analyzing and predicting academic success or failure. The test can be passed in a group manner to children who do not speak the local language or to children who have problems using language, and on

Considering that this test is a detection tool, it allows the selection of learners who suffer from learning disorders, and then benefit from in-depth diagnosis. We note that this test is applicable to children with hearing problems or problems with color vision, as it requires simple motor abilities. The test calls for four different types of logical reasoning abilities:

 Pattern completion (complétion du motif**):**

Here the child should identify the missing part that completes the drawing, and this is through a series of suggestions. The child depends in determining his answer on the general orientation and the various details of drawing the missing part and given that this type of thinking is the simplest level in the test, it is mainly found in formulas For the primary stage, the total number of items is estimated at 06.

 Analogical reasoning (Raisonnement Analogique)

This type of thinking requires the child to know the logical relationships between the various geometric shapes, and for the child to get the correct answer, he must analyze the changes that occur on the shapes according to their appearance vertically or horizontally. By analogy, it is according to the degree of difficulty from simple to complex and according to the degree of changes that should be considered, the sum of the items is 10.

 Sequential reasoning (Raisonnement en Série):

They appear here in the form of a series of drawings that change in appearance (in terms of shape, content, ...) according to changing their position horizontally or vertically within the matrix. These items impose on the child an understanding of the logic of the sequence (recognizes the arrangement of shapes, circle, triangle, square, ...) To respect this arrangement in the missing part of the matrix, the sum of the items is estimated to be 08.

 Space representation (Représentation Spatiale):

The child or the student is required to recognize the result of adding two or more drawings, for example, the student should represent the connection between the square and the triangle. This logic in the presentation is present in the whole matrix and different

The shapes are linked horizontally or vertically, and therefore the student must identify the shapes according to their directions. These items are considered the most difficult, especially in the case of shapes rotation or insertion, which makes identifying them difficult. A total of 14 items.

 Rating:

In all cases, the total raw point indicates the number of correct answers to all items, and if the child crosses out or chooses two answers at the same time, the wrong answer is counted.

 Rating according to sub-balances:

Sub-balances are recorded according to the geometric shapes, as each geometric shape allows calculating the correct answer for the sub-balance as follows:

For formulas (A), (B), (C), (D): the correction of the protocol is based on the correction card by calculating the correct answers, and then writing the total raw point or raw balance, and the raw sub-balances in the table shown in the back of the brochures scroll.

As for the formulas (Les forms) (E), (F), (G), the punctuation is immediately after the written registration of the school children on the first paper.

It should be noted that the formula applied to the current study cases is the formula D (8 to 9.5 years), which calls for the ability to think by analogy, the ability to complement the model, sequential thinking, and spatial representation.

 Interpretation of the results:

To perform the interpretation of the results, the raw total point must be converted to the normative or scalar point, and then the sub-balances must be interpreted in a qualitative manner.

6- Presentation, analysis, and discussion of the results of the study:

1.6 Presentation and analysis of the results of the first case of non-verbal thinking abilities test:

This test allowed us to examine the non-verbal abilities of the case, as it enabled us to verify the integrity of the thinking and problem-solving abilities. The age of the case forces us to choose the appropriate formula. We passed the formula (D). The results of the first case can be clarified through the following table:

Table No. (02): The answers of the first case (9 years and 5 months) to the non-verbal abilities test according to the type and objective of the items.

Test items by type of non-verbal ability	Correct answer number according to the correction card	Case answer number via shape mapping	Case answer number via shape mapping (try 2)	Test items by type of non-verbal ability	Correct answer number according to the correction card	Case answer number via shape mapping	Case answer number via shape mapping (try 2)
1	3	3		20	2	2	

ISSN: 2663-5798

2 Δ	5	***	2	21 ○	1	1	
Δ3	4	4		22□	3	***	2
4 Δ	1	***	4	◇ 23	1	***	3
5◇	5	***	4	24□	2	2	
6 ○	4	4		25□	3	***	4
□7	4	***	1	26□	4	4	
Δ8	2	***	5	27□	5	***	4
◇9	2	***	4	28□	2	***	5
Δ10	4	***	3	□29	5	***	3
◇11	3	***	2	30○	2	***	5
○12	1	***	2	31□	5	***	3
Δ13	2	***	4	32○	1	***	3
◇14	4	***	3	33□	3	***	2
◇15	3	***	4	34□	5	***	2
16◇	4	***	5	35○	2	***	1
17◇	4	***	1	□36	3	***	2
○18	4	***	1	37○	1	***	4
□19	2	2		38○	2	***	1

The key

Δ : Pattern completion item

○ : Analogical reasoning item

◇ : Sequential reasoning item

□: Space representation item.

***: Incorrect answers.

Table No. (03): The results obtained in the non-verbal abilities test of Naglieri (formula D) for the first case

ISSN: 2663-5798

axles	number of items	The number of correct answers
Pattern completion (PC)	**06**	**01**
Analogical reasoning (RA)	**10**	**03**
sequential reasoning (SR)	**08**	**00**
space representation (SV)	**14**	**04**
• Total raw point: 08 • Standard point / age : 552 • Nonverbal Ability Index (NAT): 73		

The results of the first case shown in Table No. (03) show that it obtained the total raw point (08), which corresponds to the peaceful or normative point 552. By referring to the table of non-verbal abilities index values corresponding to the standard points by age, we find that the case obtained the non-verbal abilities index Verbal (NAI): 73 By referring also to the table of the percentiles (Rangs percentiles) corresponding to the values of the non-verbal abilities index, the percentile ranking for the first case appears: 4%, which means that 4% of children between the ages of 09 years and 5 months obtain a The NAI is less than or equal to 73.

Therefore, the case was not able to identify the missing parts that complete the various shapes presented to it, and its results were weak in identifying the logical relationships between the various geometric shapes through a lack of attention to the details of the shapes. All this shows that the non-verbal abilities of the first case are very weak at the level of the ability to complete the model and sequential thinking and below average at the level of thinking ability by similarity and spatial representation.

2.6 Presentation and analysis of the results of the second case of non-verbal abilities test:

We present the results of the second case of the NNAT non-verbal ability test according to the type and objective of the items. Each item calls for a kind of thinking and problem-solving abilities (PC / RA / SR / SV).

Table No. (04): Answers to the second case (08 years and 5 months)

Test items by type of non-verbal ability	Correct answer number according to the correction card	Case answer number via shape mapping	Case answer number via shape mapping (try 2)	Test items by type of non-verbal ability	Correct answer number according to the correction card	Case answer number via shape mapping	Case answer number via shape mapping (try 2)
1◯	3	3		□20	2	2	

Δ2	5	***	4	21◯	1	1	
Δ3	4	***	5	□ 22	3	3	
Δ4	1	1		◇ 23	1	1	
◇ 5	5	***	2	□ 24	2	***	3
6 ◯	4	4		25□	3	3	
7 □	4	***	2	26 □	4	4	
Δ8	2	2		□ 27	5	5	
9◇	2	***	1	□ 28	2	2	
Δ10	4	4		29□	5	5	
11◇	3	3		◯ 30	2	2	
12 ◯	1	***	3	□ 31	5	***	2
13 Δ	2	2		32◯	1	1	
14◇	4	***	2	□ 33	3	3	
15◇	3	3		34□	5	5	
16◇	4	4		35◯	2	2	
17◇	4	4		36□	3	3	
18 ◯	4	***	3	37◯	1	***	2
19 □	2	2		◯ 38	2	***	3

We also summarize the results of the second case in Table No. (05), which shows the Nonverbal Abilities Index (NAI), through which the location of the case's nonverbal cognitive competency is extracted.

Table No. (05): Results Obtained in Non-Verbal Abilities Test of Naglieri (Formula D) for the second case

axles	number of items	The number of correct answers
Pattern completion (PC)	**06**	**04**
Analogical reasoning: (RA)	**10**	**06**

sequential reasoning: (SR)	**08**	**05**
space representation: (SV)	**14**	**11**

- Total raw point: 26
- Standard point / age : 651
- Nonverbal Ability Index (NAT): 112

It is clear from the results of the second case in Table No. (05) That it obtained the total raw point 26, which corresponds to the peaceful or normative point 651. By referring to the table of non-verbal abilities index values, corresponding to the standard points by age, we find that the case obtained the non-verbal abilities index (NAI) 112, Returning also to the table of (Rangs percentiles) corresponding to the values of the non-verbal abilities index, it is clear that the percentile ranking for the second case is 79%, which means that 79% of children between the ages of 8 years and 5 months obtain a (NAI) less than or It is equal to 112, this shows that the abilities of the second non-verbal case are normal, It is above average at the level of similarity thinking ability, model compliment ability, and sequentially thinking ability, and good at the level of spatial representation ability.

6.3 Presentation and analysis of the results of the third case of non-verbal abilities test:

Table No. (06): The responses of the third case (09 years) to the non-verbal abilities test according to the type and objective of the items.

Test items by type of non-verbal ability	Correct answer number according to the correction card	Case answer number via shape mapping	Case answer number via shape mapping (Try 2)	Test items by type of non-verbal ability	Correct answer number according to the correction card	Case answer number via shape mapping	Case answer number via shape mapping (Try 2)
1◯	3	3		□ 20	2	***	5
2 Δ	5	***	2	21◯	1	***	3
Δ3	4	4		□ 22	3	***	2
4 Δ	1	***	2	23◇	1	***	2
5◇	5	5		24□	2	***	3
6 ◯	4	4		25□	3	***	4
□ 7	4	***	2	□ 26	4	***	2
Δ8	2	2		27 □	5	5	
9 ◇	2	2		28 □	2	***	3
Δ10	4	***	5	29□	5	5	
1K◇	3	3		30◯	2	2	

12◯	1	***	5	31□	5	***	4
Δ13	2	2		32◯	1	***	4
14◇	4	***	1	□33	3	3	
◇15	3	3		34□	5	***	2
16◇	4	***	2	35◯	2	***	1
17◇	4	4		36□	3	***	5
◯18	4	4		37◯	1	***	4
19 □	2	***	3	38◯	2	***	1

Table No. (07): Results Obtained in the Non-Verbal Abilities Test of Naglieri (Formula D) for the third case

axles	**number of items**	**The number of correct answers**
Pattern completion: (PC)	**06**	**03**
Analogical reasoning :(RA)	**10**	**04**
Sequential reasoning :(SR)	**08**	**05**
Space representation :(SV)	**14**	**03**
• Total raw point: 15 • Standard point / age : 595 • Nonverbal Ability Index (NAT): 86		

It is evident from the results of the third case in Table No. (07) That it obtained the total raw point 15, which corresponds to the peaceful or normative point 595. By referring to the table of non-verbal abilities index values, corresponding to the standard points by age, we find that the case obtained the non-verbal ability index Verbal (NAI) 86, also referring to the table of percentiles (Rangs percentiles) corresponding to the values of the non-verbal abilities index, it becomes clear that the percentile ranking for the second case is 18%, and this means that 18% of children aged 9 years have a (NAI) less than or equal to (NAI) 86, This shows that the abilities of the third non-verbal case are weak, as they are above average at the level of the ability of sequential thinking and within the average at the level of the ability to complement the model and below the average at the level of the ability of spatial representation and similarity thinking.

AJSP
المجلة العربية للنشر العلمي
الإصدار الخامس - العدد السادس والأربعون
تاريخ الإصدار: 2 – آب – 2022م
www.ajsp.net
ISSN: 2663-5798

6.4 Presentation and analysis of the results of the fourth case of non-verbal abilities test:

Table No. (08): The answers of the fourth case (9 years) to the non-verbal abilities test according to the type and objective of the items.

Test items by type of non-verbal ability	Correct answer number according to the correction card	Case answer number via shape mapping	Case answer number via shape mapping (Try 2)	Test items by type of non-verbal ability	Correct answer number according to the correction card	Case answer number via shape mapping	Case answer number via shape mapping (Try 2)
1◯	3	3		20□	2	***	4
Δ2	5	5		21◯	1	1	
Δ3	4	4		□22	3	3	
4 Δ	1	1		23◇	1	1	
5◇	5	5		24□	2	2	
6 ◯	4	***	2	□25	3	3	
7 □	4	4		□26	4	4	
8 Δ	2	2		27□	5	5	
◇9	2	2		28□	2	***	3
Δ10	4	4		29□	5	5	
11◇	3	***	4	30◯	2	2	
◯12	1	1		31□	5	5	
13 Δ	2	2		32◯	1	1	
14◇	4	4		33□	3	3	
15◇	3	***	1	34□	5	***	1
◇16	4	***	1	35◯	2	***	5
17◇	4	4		36□	3	3	
18◯	4	4		37◯	1	***	2
19□	2	2		38◯	2	***	4

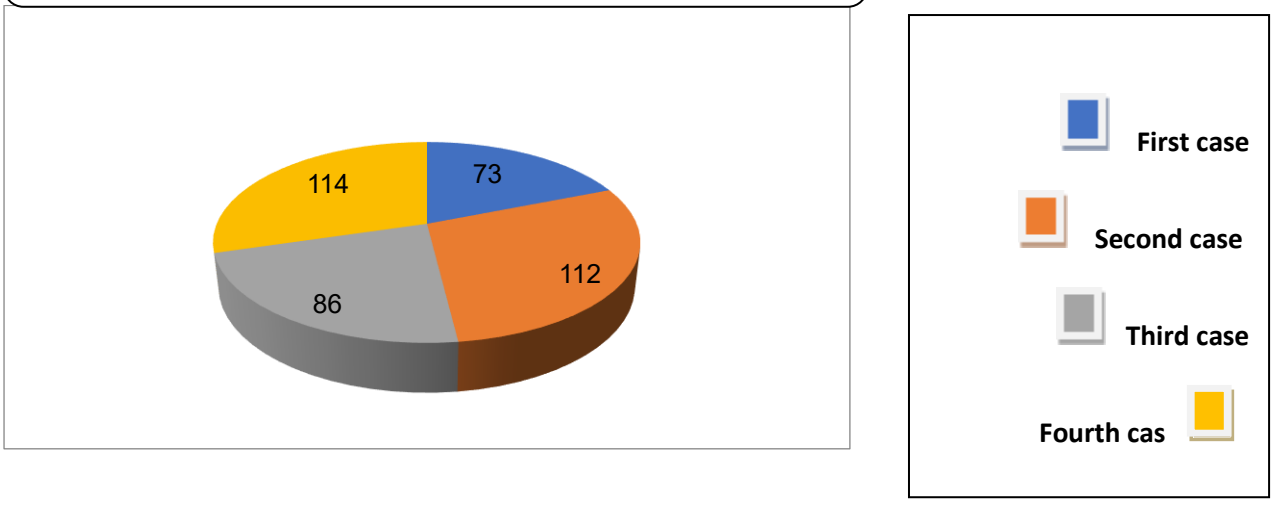
AJSP
المجلة العربية للنشر العلمي
الإصدار الخامس - العدد السادس والأربعون
تاريخ الإصدار: 2 – آب – 2022م
ISSN: 2663-5798
www.ajsp.net

Table No. (09): Results Obtained in the Test of Non-Verbal Abilities of Naglieri (Formula D) for the fourth case

axles	number of items	The number of correct answers
Pattern completion: (PC)	**06**	**06**
Analogical reasoning :(RA)	**10**	**06**
Sequential reasoning:(SR)	**08**	**05**
Space representation: (SV)	**14**	**11**
• Total raw point: 28 • Standard point / age : 664 • Nonverbal Ability Index (NAT): 114		

It is clear from the results of the fourth case in Table No. (09) That it obtained the total raw point 28, which corresponds to the peaceful or normative point 664. By referring to the table of non-verbal abilities index values, corresponding to the standard points by age, we find that the case obtained the non-verbal abilities index (NAI) 114, Returning also to the table of (Rangs percentiles) corresponding to the values of the non-verbal abilities index, it is clear that the percentile ranking for the second case is 82%, and this means that 82% of children aged 9 years have a (NAI) less than or equal to 114, This shows that the fourth non-verbal abilities are normal, so they are good at the level of spatial representation ability and model completion, and above average at the level of the ability to think in sequence and the ability to think by analogy.

Figure No. (02): Percentages of using the types of non-verbal thinking abilities in the cases according to Naglieri 's test



The results of the general cases of the Nonverbal Abilities Test (NNAT) show that the percentages of the degree of use of nonverbal thinking abilities vary between cases, and that each case depends on a specific type of nonverbal abilities.

So that it appears that the cases tend to use a specific type of thinking, such as pattern completion and spatial representation, at the expense of other types, and this is what is shown by the total of the most frequent correct answers, which was estimated at 6 out of a total of 06 for the pattern completion item, as for the spatial representation, the highest repeated correct answers

were estimated b 11 out of a total of 14, while difficulties appeared in using the remaining types of thinking, i.e. thinking by analogy and sequential thinking.

Discussing the results:

Based on the findings of the current study and based on the theoretical framework, we discuss the results considering the study's hypotheses.

- Discussing the results considering the main hypothesis "Children who are hard of hearing and who have cochlear implants suffer from difficulties in non-verbal thinking and problem-solving abilities."

Based on the presentation and analysis of the results of the cases after applying the test of non-verbal thinking and Naglieri's problem-solving abilities, it appeared that the cases obtained scores ranging from 08 to 28 total raw points. Some cases faced slight difficulties when passing the test items because the matrix is based on drawing attention and focus and taking a sufficient period of thinking to fill the void, but they generally responded with the content and instructions of the test, especially cases "2 and 4".

As for cases 1 and 3, they had a severe difficulty that appeared when passing some items, as they could not distinguish between the components and details of the visual shapes, which required a longer time to answer.

By analyzing and discussing the results obtained after applying the nonverbal thinking and problem-solving abilities test, on four cases ranging in age from 8 years to 9 years and 5 months, we conclude that hearing-impaired children and cochlear implant carriers suffer from difficulties at the level of non-verbal thinking abilities and Problem solving, and therefore the main hypothesis has been fulfilled.

As for the partial hypotheses:

"Children who are hard of hearing and who have cochlear implants suffer from difficulties in completing the pattern." We notice that the average of the cases' answers was 3.5, i.e. That is, above the average, and therefore the partial hypothesis was not fulfilled, and this was shown by Figure No. (2), which clarified the concentration and dependence of cases on completing the pattern more than other non-verbal thinking abilities.

"Children who are hard of hearing and who have cochlear implants suffer from difficulties in analogical reasoning." We notice that the average answers of the cases were 4.75, i.e. below the average, and therefore the partial hypothesis was fulfilled, and this is suitable for the aforementioned results, which shows the cases's slight use of analogical reasoning.

"Children who are hard of hearing and who have cochlear implants suffer from difficulties in sequential reasoning." We notice that the average of the cases' answers was 3.75, which is below the average, and therefore the partial hypothesis was fulfilled, and this is suitable for the results, which shows the cases's slight use of sequential reasoning.

"Children who are hard of hearing and who have cochlear implants suffer from difficulties in spatial representation." We notice that the average of the cases' answers was 7.25, which is above the average, and therefore the partial hypothesis was not fulfilled, and this is suitable for the results that were shown in Figure No. (2), which shows the cases's appropriate use of spatial representation.

- Conclusion:

Mature thinking is characterized by flexibility, which means the use of all kinds of verbal and nonverbal thinking abilities, appropriately for the confrontational situations and at the appropriate time, but this cognitive employment may be affected by the presence of a sensory defect that prevents the completion of the neurological functional cycle of the lower cognitive processes, to which more complex and interactive processes are directly related. And integration, which is the higher cognitive processes, which made man the master of creatures and the only accountant on the face of the earth. A hearing-impaired despite being compensated with an aid machine, his cognitive growth was affected, which was reflected negatively in his use of his various thinking abilities and formed a barrier standing in the way of the launch of his thought and its development.

- Suggestions:

Early detection of hearing impairment to reduce the damage invasion.

- Awareness and habilitation of families, educators in nurseries, and teachers in schools, about disabilities in general and hearing disabilities.

- Focusing on special education by creating well-equipped specialized schools and activating the role of specialists.

- Creating and using modern programs for cognitive habilitation for people with special needs.

- Developing alternative educational programs, and the need to encourage multidisciplinary sponsorship.

List of references:

Ajad Muhammad Al-Arabi (2018): Delayed oral language in the child in the light of the concepts of the modern Hebron theory (a clinical linguistic approach, thesis for obtaining a doctorate degree in the third phase in Artovonia, Faculty of Social Sciences, Department of Artuvonia, University of Algiers 02.

Navigator Tamer El Maghawry Mohamed (2016): Hearing impairment between rehabilitation and technology, Alukah Network.

Hamid Abdel Salam Zahran (2005): Childhood and Adolescence Developmental Psychology, World of Books Publishing House, Egypt.

Hanafi Ali Abd al-Nabi (2003): Introduction to Hearing Impairment, 1st Edition, Academy of Special Education, Riyadh.

Abdel Moneim Amin Al-Quraiti (2004): Guidance for people with special needs and their families, 1st edition, World of Books - Cairo.

Adnan Youssef Al-Atoum (2006): Cognitive Psychology - Theory and Application, Dar Al-Masira and Distribution, 1st Edition, Jordan.

Fotiha Fatiha (2010): The extent of the efficacy of pedagogical support in school success for hearing-impaired students who are integrated into regular departments, a memorandum supplementing the obtainment of a master's degree, University of Algiers.

Metwally Fikri Latif (2019): Using laser techniques to stimulate attention in hearing-impaired children with cochlear implants, Arab Journal of Disability and Gifted Sciences, No. 07.

Malkawi, Mohamed Mahmoud Zayed (2011): The effectiveness of a training program to improve the pronunciation of some Arabic sounds for moderately hearing-impaired children in kindergarten, Damascus University Journal, Volume 27, Issue 1 + 2.

Mousa Najeeb Moawad (2013): The concept of problem solving, publishing and distribution services and scientific research, 1st floor, Amman

djouadi louiza et Adrar terbah (2015), les aptitudes non verbales chez les enfants sourds. Bejaia, Algérie.

Estienne (1980), méthode d'entrainement à la lecture et dyslexie (les stratégies de lire), Masson. Paris.

English H, English A (1958) à comprehensive dictionary of psychologically, new York.

الإصدار الخامس - العدد السادس والأربعون
تاريخ الإصدار: 2 – آب – 2022م
www.ajsp.net
ISSN: 2663-5798

"قدرات التفكير بالإدراك لدى الأطفال ضعيفي السمع وحاملي الزرع القوقعي"

إعداد الباحثان:

أ. د. عادل محمد محمد خضير

أستاذ بقسم الإعلام والسياحة والفنون، كلية الآداب، جامعة البحرين

د. عبلة محرز

أستاذ مساعد بجامعة وهران 2 (محمد بن أحمد)، الجزائر

الملخص:

تعد قدرات التفكير من اهم العمليات المعرفية العليا التفاعلية التي تتطور وتنمو خلال مرحلة الطفولة، والتي تتأثر بظروف وخصوصيات الطفل الجسمية والعقلية والنفسية، فالأطفال من ذوي الاحتياجات الخاصة يعانون من عرقلة الإعاقة لاكتمال نموهم ونضجهم على جميع الأصعدة، مما في ذلك العمليات المعرفية العليا وعلى راسها التفكير، الذي يجمع ويوظف في تفاعل وتكامل جميع العمليات الأخرى، وتعتبر فئة الأطفال ضعيفي السمع والحاملين للزرع القوقعي ضمن هذه الفئة الحساسة والتي تستلزم تكفل وعناية خاصة.

لذا هدفت دراستنا الحالية الى قياس قدرات التفكير غير اللفظية المعتمدة على الإدراك البصري وحل المشكلات لدى هذه الفئة من الأطفال، باستخدام مقياس ناقليري –NNAT (Naglieri Non Verbal Ability Test)– عبر دراسة أربع حالات لأطفال متمدرسين من عمر ثمانية وتسعة سنوات، حيث اظهرت النتائج العامة للدراسة انهم يعانون من صعوبات على مستوى قدرات التفكير غير اللفظية وحل المشكلات، وان نسب استعمال الأنواع المختلفة لقدرات التفكير غير اللفظية متفاوتة لديهم، مما له أثر سلبي على مردوديتهم الدراسية ونشاطهم المعرفي بشكل عام.

الكلمات المفتاحية: قدرات التفكير غير اللفظية–الإدراك البصري– الإعاقة السمعية– الأطفال ذوي الاحتياجات الخاصة– ضعيفي السمع وحاملي الزرع القوقعي.