

DEVELOPMENT OF MEMORY SKILLS IN PRESCHOOLERS

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Abstract:

The aim of the research was to identify a progression in the memory skills of children aged 3 to 6 years, using three memory development techniques: memorization, retelling with images and memory games. The objectives of the study are: determining the degree of reproduction of a memorized poem, identifying progress in children's stories telling and setting the level of performance in memory games. Techniques used in this research have demonstrated through the results obtained that they are techniques that contribute to the development of preschoolers' memory.

Keywords: memory, preschoolers children, memory games method, storytelling

Popescu-Neveanu explains memory as a complex psychic process “*of storing and destocking information, of accumulating and using experience*” (Popescu-Neveanu, 1978, p. 435). Between the mnemonic process and the other psychic processes there is a relationship of interdependence, influencing the development of all of them, but in turn being imprinted by the formation and development of other psychic processes.

Memory has aroused the interest of numerous researches that have been carried out over time, both in adults and children. Some of this research is presented below to better understand this mental process.

In 2012, research was conducted on the neuropsychological assessment of episodic memory in preschoolers, which allows rapid learning and retention of new information until they are brought back to the attention of the subject. The development of episodic memory is involved in childhood amnesia, meaning the inability relative to adulthood to reproduce memories of events in the first 3-4 years of life. In order to evaluate the episodic memory, aspects such as

remembering and recognizing the story, word pairs, remembering and recognizing some images and remembering a series of numbers are followed. The study of the neuropsychological evaluation of preschooler's memory showed that from the first year of life there are substantial memory skills, only that during preschool they change rapidly. At the same time, during the first year of life and early childhood there is a risk of delay in the development of memory. (Bauer, Leventon, & Varga, 2012).

Another research from 2013 started from the idea that nap after lunch improves the learning and memory of preschoolers. The researchers started from the premise that sleep brings benefits to adults and tested this aspect in children too. In this research, children received a visual-spatial task in a memory game, because memory tasks are resumed at the neuronal level during sleep. Children memorized the position of some pictures (9-12 pictures), and then, they indicated their initial position. The procedure was repeated until the children memorized the position of all the images. Immediately after the memorization, the refresher phase took place, but children failed to solve the task. When they had to sleep, the children were divided into two groups and only one of the groups slept. After the noon sleep, all the preschoolers solved the work task again, and the next day, the update was done once more. Children had similar results to the immediate update, in both conditions. However, the delayed update was significantly higher for preschoolers who slept than for those who were awake. When updated the next day, the results were similar to those who took the afternoon nap, which supports the idea that sleep strengthens the long-term memory process. (Kurdziel, Duclos, & Spencer, 2013).

In 2017, another research took place on the topic of memory process, a research that followed the effect of sleep in retaining certain information. The target group was made of typical preschool children and preschool children with Down Syndrome, because it is known that the latter have sleep disorders and memory deficiencies. The study showed that preschoolers with a typical development retained the information immediately, while preschoolers with Down Syndrome retained the information after waking up after a 4-hour nap. After 24 hours and implicitly, after the preschoolers had a sleep longer than 4 hours, it turned out that the information was still retained by children with a typical development, while children with Down Syndrome forgot information. Therefore, sleep has a beneficial effect on memorization in typical children, but has been shown to be ineffective in atypical children. (Spanò, Gómez, Demara, Cowen, & Edgin, 2017).

Another research studies the evolution and remediation of preschoolers activities, when they play analog or digital memory games, but also the comparison between the two. In Sweden, preschoolers frequently use memory games in both digital and analog form to develop their memory, focus and language. The results of the research showed that analog memory games develop the mnemonic strategies of preschoolers and in addition they develop competition, attention to detail, communication, deviation from the rules, while digital memory games develop trial and error strategies, individual commitment, exploratory discovery and control and adaptation of technology. In other words, digital games divert preschoolers learning to playful interests and diminish the effort to solve a task, while analog memory games pursue their purpose and help children develop mnemonic abilities and strategies without distracting them. (Nilsen, Lundin, Wallerstedt, & Pramling, 2018).

Another recent study, aimed to test various means of improving the working memory performance of preschoolers aged 4 and 5 years. In this sense, the preschoolers were divided into two groups and received a memorization task. At the same time, the experimental group was communicated a clear objective for which it has to solve the received task, while the control group was not communicated the objective for which it has to solve the received task. The results obtained indicated significant differences between 4-year-old and 5-year-old preschoolers. In the case of 4-year-old preschoolers, no differences in memory were identified depending on the objective of the task. However, in the case of 5-year-olds, the differences between the two types of tasks were significant, demonstrating that working memory performance in 5-year-olds can be improved if they know the clear goal for which they have to memorize. an informational content (Fitamen, Blaye, & Camos, 2019).

The present research aimed to conduct an exploratory study to determine whether scientific hypotheses are confirmed or refuted and to find out whether the chosen evidence contributes to the development of preschooler's memory.

1. Aim of the study

Identify an increase in the level of memory skills of children aged 3 to 6 years, using three memory development techniques: memorization, children's storytelling and memory games.

2. Objectives of the study

O1 - determining the degree of reproduction of a memorized poem

O2 - identifying progress in children's stories telling

O3 - setting the level of performance in memory games.

3. Research hypothesis

3.1. General hypnosis's

- There is progress in the mnemonic abilities of preschoolers, using methods of memory development such as: memorization, retelling based on images and memory games.

3.2. Specific hypotesys

- There is an inversely proportional correlation between the number of repetitions of poetry and the age of preschoolers (3-6 years).
- There is a strong significant correlation between the age of preschoolers (3-6 years) and the degree of retelling of a text.
- There is a strong correlation between the complexity of poetry and the level of performance in memory games.

4. Research instruments

One of the methods applied was memorization, which aimed to reproduce the poem "How does spring come?" by Florin Costinescu. For the children of first level preschoolers, the reproduction of the first stanza was requested, for the children of the middle level preschoolers, the reproduction of the first two stanzas were required, and for the children of high-level preschoolers, the reproduction of the whole poem was requested, taking into account the age peculiarities of the children. Also, because the memory of preschoolers is largely concrete, representative supporting images were used for the text of the poem.

The second method used in this research is the method of retelling after images, which aimed to retell a listened text, with the help of supporting images. The story chosen for the application of this method was the story "Goat with three fawns" by Ion Creangă. Small preschoolers have eight images, middle level preschoolers have seven images at hand, and high-level preschoolers had six images.

The memory games method is another method that aimed to develop children's memory and attention, by composing pairs of images in a given time frame. The children had a few pictures upside down and had to find the pairs of pictures in five minutes. The rule of the game

was to turn upside down a maximum of two images simultaneously. If there are no pairs, they are turned upside down again and the procedure is repeated. Depending on the age of the children, four, six or eight images were used.

5. Research sample

The research sample consisted of 57 preschoolers aged between 3 and 6 years. The participants were 31 boys (54.4%) and 26 girls (45.6%) (Table 1).

Table 1–Research sample structure based on gender

<i>Gender</i>				Valid	Cumulative
		Frequency	Percent	Percent	Percent
Valid	Masculin	31	54.4	54.4	54.4
	Feminin	26	45.6	45.6	100.0
	Total	57	100.0	100.0	

Another criterion for the distribution of subjects is the age criterion, according to which we can establish four age categories. The 57 participants in this research are in proportion of: 31.6% (18 children) aged 3 years, 33.3% (19 children) aged 4 years, 24.6% (14 children) aged 5 years and 10.5% (6 children) aged 6 years (Table 2). The subjects are part of three preschool levels: first level, middle level and high level.

Table 2 – Research sample structure based on age

				Valid	Cumulative
		Frequency	Percent	Percent	Percent
Valid	3	18	31.6	31.6	31.6
	4	19	33.3	33.3	64.9
	5	14	24.6	24.6	89.5
	6	6	10.5	10.5	100.0
	Total	57	100.0	100.0	

This sample was compiled by opportunistic sampling. The sampling was done through various methods of dividing the group's team, using counters and the voluntary choice by children of graphic signs. Therefore, the choice of participants was not influenced in any way by the researcher.

6. Variables

The study aims to identify a progress in the mnemonic abilities of preschoolers, using three memory development techniques: memorization, children's storytelling and memory games. The independent variables are: the gender and age of preschoolers, and the dependent variables are: the degree of reproduction of a poem, the ability to retell and the level of performance in the memory game.

7. Conducting research

The research started from the researcher's observations during the interactions with preschoolers. Children are interested in poetry, songs, stories and especially play. At the same time, the experience of a recent examination of the researcher and the need to retain a large volume of information, led to this research.

In order to verify the hypotheses, the three above mentioned methods were applied to the group: memorization, storytelling and memory games. The memorization consisted in going through several successive stages. The peculiarities of age, the intellectual ones and the theory of the area of the next development of preschoolers were landmarks in establishing the differentiated performance level, so that beginner level preschoolers memorized only the first stanza of poetry, middle level preschoolers memorized the first two stanzas of poetry, and high-level preschoolers memorized all the poetry. In order to assess the level of memorization skills, in addition to the number of stanzas memorized according to age (3 years - 0-1 stanzas; 4 years - 1-2 stanzas; 5 years - 2-3 stanzas; 6 years - 3 stanzas) and the number of repetitions necessary for memorization (3 years - 5 repetitions, 6 years - 2 repetitions).

Another method used was the method of retelling after images, which followed the degree to which preschoolers retell the previously heard story, based on the supporting images. Once again, the mental peculiarities of the preschoolers and the area of the next development were taken into account. Therefore, the 3-year-olds had at their disposal eight images with the significant events of the story, the 4-year-olds, seven images, and the 5-6-year-olds, six supporting images. In order to appreciate the level of the quality of the retelling, we followed the

number of mentioned characters (several characters, most of the characters, all the characters) and the mentioned details (few details, some details, many details).

The method of memory games is the third method, which aimed to develop memory by forming pairs of images, retaining their position. The target performance level was differentiated according to the psycho-intellectual characteristics of the children, so that the beginner level preschoolers had four images (two pairs), the middle level preschoolers had six images (three pairs), and the high level preschoolers had eight images (four pairs). For this exercise, the children had five minutes. Only the correct number of pairs of cards (0-4 pairs of pictures) were taken into account to measure the children's performance.

8. Results

First hypothesis – There is an inversely proportional correlation between the number of repetitions of poetry and the age of preschoolers (3-6 years).

Tabel 3 - Statistică descriptivă

For the first hypothesis, the correlation was made between the age of the children (3-6 years) and the number of repetitions of the poem necessary for them to retain its content. The younger the age, the more repetitions. In the third table (Table 3) it is observed that

<i>Descriptive Statistics</i>					
	N	Min	Max	Mean	Std. Deviation
Vârsta	57	3	6	4.14	.990
RepetăriM	57	2	5	3.49	.826
Valid N (listwise)	57				

there are children aged between 3 years (Min) and 6 years (Max), and the average age is 4.14 years (Mean). At the same time, the number of repetitions for memorizing the poem is between 2 (Min) and 5 repetitions (Max), with an average of 3.49 repetitions (Mean).

To test the hypothesis, a Pearson correlation was made between variables, and the results can be seen in Table 4. From the data obtained, there is a strongly significant parametric correlation between the variable age and the number of repetitions of poetry, with a significant coefficient $r = .000$, at a significance threshold less than $p < 0.01$. Also, from the table we can see that this correlation is negative, ie inversely proportional.

Table–Parametric corelation

This means that the hypothesis according to which there is an inversely proportional correlation between the number of repetitions of poetry and the age of preschoolers (3-6 years). This can be explained by the fact that, with age, children's memory develops due to the exercises performed over time and thus, children retain the content of a poem faster. From these results it can be deduced that by exercising memory it becomes faster and more efficient over time.

<i>Correlations</i>		Vârsta	RepetăriM
Age	Pearson Correlation	1	-.762**
	Sig. (2-tailed)		.000
	N	57	57
Repetitions	Pearson Correlation	-.762**	1
	Sig. (2-tailed)	.000	
	N	57	57

** . Correlation is significant at the 0.01 level (2-tailed).

Second hypothesis – There is a strong significant correlation between the age of preschoolers (3-6 years) and the degree of retelling of a text.

Table4–Descriptive statistics

In testing the second hypothesis, a Pearson-type correlation was made between the age of preschoolers (3-6 years) and the degree of retelling of a text. For the dependent variable, two aspects were taken into account, namely: the number of characters and the details of the story. In the table above (Table 5) the data

<i>Descriptive Statistics</i>						
	N	Min	Max	Sum	Mean	Std. Deviation
Age	57	3	6	236	4.14	.990
Character s	57	1	3	122	2.14	.718
Details	57	1	3	118	2.07	.704
Valid N (listwise)	57					

of the three variables are entered and it is found that the number of characters mentioned by the

children has values between 1 = several characters (Min) and 3 = all characters (Max), the average being 2, 14 = most characters (Mean). At the same time, the variable details of the story have values between 1 = few details (Min) and 3 = many details (Max), the average being 2.07 = a few details (Mean).

Table 6–Parametric correlation

The parametric correlation had the results from table 6, according to which between the age of preschoolers (3-6 years) and the number of characters I remember there is a strongly significant correlation with a correlation coefficient $r = .000$, at a threshold of significance less than $p < 0.01$. The correlation is positive, meaning is directly proportional. It is also confirmed that between the children's age and the details they remember about the story, there is a strong significant correlation with a significance coefficient of $r = .000$, at a threshold lower than $p < 0.01$, this correlation being direct proportional. Therefore, we can say that the hypothesis which says there is a strong significant correlation between the age of preschoolers (3-6 years) and the degree of retelling of a text, is confirmed.

Correlations

		Character		
		Age	s	Details
Age	Pearson	1	.575**	.498**
	Correlation			
	Sig. (2-tailed)		.000	.000
	N	57	57	57
Character	Pearson	.575**	1	.758**
	Correlation			
	Sig. (2-tailed)	.000		.000
	N	57	57	57
Details	Pearson	.498**	.758**	1
	Correlation			
	Sig. (2-tailed)	.000	.000	
	N	57	57	57

** . Correlation is significant at the 0.01 level (2-tailed).

Third hypothesis – There is a strong significant correlation between the complexity of poetry and the level of performance in memory games.

Table 6–Descriptive statistics

Descriptive Statistics

						Std.
						Deviation
N	Min	Max	Sum	Mean		

The last hypothesis was verified by the analysis of the correlation between the complexity of poetry and the level of performance in memory games.

Memorization	57	0	3	102	1.79	.959
MemGame	57	0	4	133	2.33	1.185
Valid N (listwise)	57					

According to Table 7, the number of stanzas stored has variations from no stanza (Min) to 3 stanzas (Max), with an average of 1.79 stanzas retained (Mean), and the number of correct pairs identified has variations from no pair (Min) to 4 pairs (Max), with an average of 2.33 identified pairs (Mean). Following the Pearson correlation, the data below were obtained (Table 8), according to which there is a parametric correlation between the complexity of poetry and performance in memory games. The significance coefficient of $r = .000$, at a significance of $p < 0.01$, indicates that this correlation is strongly significant. It is also a directly proportional correlation, because the more the complexity of poetry increases, the higher the performance in memory games.

Table 8–Parametric correlation

Through the obtained results, the above hypothesis is validated. Both memorization and memory games stimulate the development of memory and the more complex preschoolers can memorize poems, the higher their performance in memory games.

<i>Correlations</i>		Memorization	MemoryGame
Memorization	Pearson Correlation	1	.779**
	Sig. (2-tailed)		.000
	N	57	57
MemoryGame	Pearson Correlation	.779**	1
	Sig. (2-tailed)	.000	
	N	57	57

** . Correlation is significant at the 0.01 level (2-tailed).

9. Conclusions

The training and development of children is the ultimate interest of any teacher, and for this reason their personality is very important for them to become active and responsible adults. Achieving such results requires a holistic and harmonious development of the human personality. Every mental process is important in the life of the individual and none of them should be neglected. Memory is the mental process approached in this research and tested by attractive methods.

The aim of the research was to identify a progression in the memory skills of children aged 3 to 6 years, using three memory development techniques: memorization, retelling with images and memory games.

The evaluation of the subjects within the applied methods was done physically, within the instructive-educational activities with the preschoolers and a form was completed with their results in all three situations.

Data processing involved making parametric correlations between the age of preschoolers (3-6 years) and the number of repetitions of poetry and the degree of retelling of a text, but also a correlation between the complexity of poetry and the level of performance in memory games. These three parametric correlations proved to be statistically significant. Following the study on the development of memory in preschoolers, all hypotheses were validated. The chosen research methods proved to be useful and effective in improving the memory of preschoolers, according to the results obtained.

During memorization activities, the voluntary memory and the comprehension of the text are practiced. Using image-based retellings improves the reproduction of content in memory. Memory games are an effective way to practice memory, but much more fun. These games target the visual memory of preschoolers.

In conclusion, the techniques used in this research have demonstrated through the results obtained that they are techniques that contribute to the development of preschoolers' memory.

The limitations of the research are that the gender-independent variable was irrelevant, because no significant differences were identified based on this variable; the research sample is not representative for the whole territory of the country; first level preschoolers needed more support in understanding the rules of the memory game than in identifying pairs of cards.

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