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The Cognitive Representation of Information and its Relationship to Cognitive Style (Verbal - Conceptual) Among a Sample of Fifth Year Primary Students –A Field Comparative Study Between Typical Students and Students with Reading Comprehension Difficulties in the City of Laghouat –

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Abstract :

The current study aimed to identify the level of cognitive representation of information and verbal and conceptual cognitive styles among a sample of fifth year primary students with reading comprehension difficulties and their typical peers. To fulfill these objectives, the scale of cognitive representation of information and the scale of verbal and conceptual cognitive style were adopted after verifying their psychometric features.

They were applied to a sample of 100 male and female students from public schools affiliated with the Ministry of Education, relying on the descriptive comparative approach. After collecting and statistically processing the data using appropriate statistical methods, the results showed:

- A low level of cognitive representation of information among students with reading comprehension difficulties.
- The nature of the verbal and conceptual cognitive style among students with reading comprehension difficulties.
- A high level of cognitive representation of information among the typical sample.
- A high level of verbal and conceptual cognitive style among the typical sample.
- There were no statistically significant differences in the cognitive representation of information scale and the verbal and conceptual cognitive style scale between individuals with reading comprehension difficulties.
- There was a statistically significant relationship between cognitive representation of information and verbal and conceptual cognitive style among individuals of the sample.

Keywords: Cognitive representation of information, verbal and conceptual cognitive style, reading comprehension.

Introduction:

One of the most important developments in supporting cognitive psychology is the appearance of the cognitive approach, which is closely related to the advancements in computer science and communication sciences. The cognitive processing and information processing approach assumes two significant assumptions: - Cognitive mental processes can be compared to computer processes. - Cognitive mental processes can be explained in terms of the flow or sequence of information through a series of phases (**El-Zayyat, 1998, p. 36**). Scientists generally agree that knowledge does not perfectly mirror reality in the mind. There is increasing evidence that internal cognitive representations differ from external physical facts. The cognitive representation of information is linked to the stimuli received by the senses, but these stimuli are altered to fit with previous experiences that contain a complex network of information and relationships. Various studies have shown that information is stored in abbreviated representations (**Ayam & Razzak, 2015, p. 2120**). Therefore, the ultimate goal of cognitive representation is to fulfill deeper, better, faster, and more accurate processing when dealing with stimuli in the natural environment. Cognitive representation of information refers to the use of linguistic symbols as imaginative mental images that can be conveyed to others through familiar words that represent the cognitive representations of the individual. Various models have been suggested to explain the cognitive representation of information. The classic model proposes a linear sequence from sensation to attention, perception, storage, processing, and retrieval. However, it was realized that humans need to remember before perceiving, leading to the development of the simulation model, which depends on input, processing stages, operations, and the nature of levels. Subsequently, the

Quilts and Collian model proposed that the process is a dense and rapid network transmission in multiple directions, with information processing occurring at different levels and locations. The nature of representations involves constructing a model or a set of diagrams that illustrate the relationships between shapes, symbols, or word meanings (verbal-conceptual) (**Abbas, 2000, p. 465**). It becomes evident that cognitive representation is fundamental to all types of human knowledge because sensory experiences are encoded and connected to stored information in the brain. It is the process of extracting information from sensory experiences and integrating it into memory. Each individual introduces environmental stimuli differently from others, which can cause communication difficulties. What we notice, smell, taste, and represent in our memory differs from what others have, but the degree of similarity in representing environmental stimuli is sufficient to facilitate interaction and coexistence. The topic of internal cognitive representation has attracted the attention of scientists and researchers in cognitive psychology and is one of the prominent subjects in this area (**Ayyam & Rizak, previous reference, p. 29).**

Cognitive style is detailed and clear information that distinguishes an individual's performance defines it and provides unique features and advantages in their interaction with the environment. The term "style" refers to specific patterns of generality, where an individual responds employing one approach in one situation and responds with specific features in other situations. Cognitive style is the preferred performance of an individual to organize what they see and perceive around them, their style in organizing their experiences in memory, and their methods of retrieving stored information. Therefore, individual differences exist in the styles of perception, imagination, memory, and thinking, as well as their relationship to the differences in individuals' ways of understanding, retaining, transforming, using information, and self-understanding (**Nadia, 1982, p.110**). Cognitive style is associated with aspects related to educational processes, as it explains cognitive behavior in general and learning in particular. Besides, it is essential for acquiring, storing, and employing information. Each person has a system of cognitive processes that serve as activities or functions for the brain, and each cognitive process has its specific style, which is an essential style of response that characterizes a person's behavior in dealing with cognitive processes **(Wahid, 1995, p.26**).

Reading represents one of the most significant windows of scientific knowledge. Thus, teaching it has received greater attention from educators. Through reading, different aspects of an individual are developed, such as listening, speaking, writing skills, etc., as well as the development of previous experiences and improvement of mood through entertainment books, stories, and more. It is apparent to anyone that reading is one of the critical skills that enable linguistic communication and cognitive growth for learners. However, some obstacles prevent reading from occupying its rightful place. Students and teachers still perceive it as a pastime or a time killer in the school schedule, and there is no doubt that this view has led to underestimating and neglecting reading, resulting in the loss of the intended benefits (**Achour & Mohamed, 2009, p.347**).

1. Problem Statement:

The problem of low reading comprehension levels is not limited to a specific aspect; rather, various factors play an effective role in this decline. These factors include the teacher, teaching methods, and the student. It is appropriate to illustrate what happens in the reading lesson, where the teacher instructs the students to take out their books and read the material continuously and tediously until the lesson is over. The teacher may mention the meanings of some words or not. However, analyzing texts, identifying ideas, discussing and critiquing them, commenting on them, and elucidating the meanings behind distant phrases and values should be given more attention by the teacher (**Abdulhamid, 2006, pp. 52-53**). The researcher believes that some teachers have overemphasized this role to the extent that learners have mastered the role of mere readers who do not understand what they read or comprehend the valuable treasures contained within the language and its vast ocean. This is supported by the results of the study conducted by Al-Jarjari, which revealed the need for more knowledge among Arabic language teachers about the objectives of teaching reading and their inability to develop a love for reading among learners (**Al-Jarjari, 2002, p. 90**) Therefore, it is necessary to activate cognitive processes and the associated cognitive methods, particularly the individual's approach in receiving, processing, and storing information, considering them as unique beings with their mental, physical, and emotional characteristics. Therefore, their success and excellence depend on the type of cognitive preferences they practice in their lives (**Abu Jado, Nawfal, 2007, p. 47**). This is the central axis on which the theory of information processing and processing is based, which relates to the quantity and manner of information that can be acquired and how this acquisition occurs. Thus, cognitive psychologists, in general, and the theory of information processing, in particular, focus their attention on answering such questions and others that revolve around "how do people select? How do they infer or derive? How do they reproduce? How do they use information in the environment? What are the cognitive

controls related to the content and processes of information processing that govern the processes of selection, derivation, retention, production, and use within limited-capacity systems for information processing?" (**Al-Sayed Saqr, 2000, p. 55)**. Sian et al. (2004, p. 584) emphasized that the concept of mental representations is one of the essential and fundamental concepts of cognitive psychology, and many sciences are built on the basis of constructing cognitive mental representations in human memory. Fathi Al-Zayyat indicated that students with learning difficulties lack the effectiveness or efficiency of cognitive representation, as most acquired or learned cognitive units and concepts remain floating or drifting in their cognitive structure, lacking comprehension and consolidation. Hence, due to the lack of intentional cognitive connections between them, these units gradually fade away, diminish in number, and their effects disintegrate within the processes and systems of processing. As a result, their cognitive structure becomes shallow and weak, which, in turn, affects the subsequent comprehension or representation of cognitive units. Thus, the effectiveness or efficiency of cognitive representation is diminished in these students (**Al-Zayyat, 1998, p. 200**). Accordingly, teachers face difficulties in achieving their mission within the classroom due to the problems they encounter in conveying information and interpreting phenomena to match the imaginations and thoughts of the students. This is attributed to the weakness of their cognitive style (verbal, conceptual). Some students exhibit hostile behaviors towards their peers, while others neglect their duties and lesson preparation. However, all these behaviors can be attributed to a cause beyond their control, which is their inability to learn and make connections, not due to mental retardation, hearing, or visual impairments, but rather difficulties in perception and linking what they see and hear with what reaches their brains, leading to the weakness of their cognitive representation. Therefore, it is necessary to activate cognitive processes and the associated cognitive methods, especially the individual's approach to receiving, processing, and storing information, considering them as unique beings with their mental, physical, and emotional characteristics.

The researcher identifies a problematic in the research, which is that students with reading comprehension difficulties have deficits in cognitive processes and are more likely to struggle with the cognitive representation of information. Thus, the researcher sees the necessity of focusing on this group of students within our schools, assisting them in learning, overcoming the obstacles they face, and employing the best teaching methods to help them understand and comprehend the presented reading material, which in turn reflects on their academic performance. Based on this, the study raises the following questions:

- What is the level of cognitive representation of information among a sample of fifth-year students with reading comprehension difficulties?
- What is the level of cognitive representation of information among a sample of fifth-year typical readers?
- What is the nature of the verbal-conceptual cognitive style among a sample of fifth-year students with reading comprehension difficulties?
- What is the nature of the verbal-conceptual cognitive style among a sample of fifth-year typical readers?
- Are there statistically significant differences in cognitive representation of information among a sample of fifth-year students with reading comprehension difficulties?
- Is there a statistically significant relationship between cognitive representation of information and the verbal-conceptual cognitive style among a sample of fifth-year students with reading comprehension difficulties and typical readers?

1.2. Study hypotheses:

- The level of cognitive representation of information is low among a sample of fifth-year students with reading comprehension difficulties.
- The nature of the verbal-conceptual cognitive style is negative among a sample of fifth-year students with reading comprehension difficulties.
- The level of cognitive representation of information is high among a sample of fifth-year typical readers.
- The nature of the verbal-conceptual cognitive style is positive among a sample of typical fifth-grade readers.
- There are statistically significant differences in the cognitive representation of information and the verbal-conceptual cognitive style among a sample of fifth-year students with reading comprehension difficulties.

- There is a statistically significant relationship between the cognitive representation of information and the verbal-conceptual cognitive style among a sample of fifth-year students with reading comprehension difficulties and typical readers.

1.3. Study objectives:

- To determine the level of cognitive representation of information and the nature of the cognitive style among a sample of fifth-year students with reading comprehension difficulties. To identify statistically significant differences in cognitive representation of information and the cognitive style among a sample of fifth-year students with reading comprehension difficulties.
- To establish a statistically significant relationship between the cognitive representation of information and the verbal-conceptual cognitive style among a sample of fifth-year students with reading comprehension difficulties and typical readers.

1.4. Study importance:

- Contributing to providing information about cognitive representation of information and the differences in students with reading comprehension difficulties compared to typical readers.
- Understanding the level of cognitive representation of information among typical readers and those with reading comprehension difficulties contributes to the development of cognitive processes related to understanding written material.
- The results of this study can assist educators in designing training programs to enhance and improve cognitive representation and cognitive styles for students with reading comprehension difficulties and typical readers, leading to increased learning effectiveness, memory, thinking, and reading comprehension. This is a significant goal for any development in learning systems, programs, and content.

1.5. Study Terminology:

1.5.1. Cognitive Representation of Information:

It is defined as the process of transforming the meanings of symbolic expressions (words, symbols, concepts) and visual representations (shapes, drawings, images) and other sensory inputs into mental meanings, ideas, thoughts, and mental representations that become part of an individual's permanent cognitive structure and cognitive tools in continuous interaction with the world around them. Operationally in the current study, it is determined by the level fulfilled by the student on the cognitive representation of information scale with its five dimensions (comprehension, synthesis, derivation, generation, and application) (**Al-Zayyat, 2005, p. 676**).

Procedurally defined by the researcher: It is the cognitive mental process that depends on encoding or encoding the information received by the individual and linking it to their previous knowledge in their cognitive structure. It is the degree obtained by individuals in the sample based on their response on the cognitive representation scale.

1.5.2. Cognitive Styles:

These are the tactics that individuals subjectively control and use in learning, memorization, recall, thinking, problem-solving, and the processing of information (**Amina, 1994, p. 95**).

1.5.3. Verbal-Conceptual Cognitive Style:

The first dimension of the verbal-conceptual cognitive style is a system of symbols and words through which information can be processed. The second dimension is a tool employed by individuals to generate mental images that symbolize specific topics (**Abu Jado and Noufal, 2007, p. 38**).

Procedurally defined by the researcher: It represents the overall degree of response obtained by the participant on the verbal-conceptual cognitive style scale adopted in the current study.

1.5.4. Reading Comprehension:

It refers to individual differences in perception, memory, and thinking styles as distinct approaches to understanding, storing, and employing information encountered by individuals (**Al-Khawli, 2003, p. 34**).

Procedurally defined by the researcher: It is the inability of the participants to understand what they read and extract meaning from the written material, as indicated by their responses on the tools used in the present study.

2. Study Procedures:

Any scientific study requires a set of procedures to be followed in order to fulfill scientifically credible results. Only by following rigorous and well-designed methodological procedures and scientific steps that align with the requirements of scientific writing can credible results be obtained. These include a clear methodology and a well-structured design, homogeneity of the sample, sound procedures for identification

and selection, and appropriate research tools for the studied variables. These are means that help the researcher in obtaining valuable scientific results, seeking to consider them in this study. The researcher has taken care to follow correct methodological steps, along with organized and sequential procedures, to present the study in the best possible form and content.

2.1. Study Methodology:

The research methodology is a critical element of scientific research, as it helps identify the approach the researcher will take in collecting, analyzing, discussing, and interpreting data and also aids assess the quality of the research (**Musaad Al-Nouh, 2004, p. 121**). In this study, a comparative descriptive methodology has been adopted, as it will examine the differences between two samples (a sample of students with reading comprehension difficulties and a sample of typical students) in a cognitive variable: cognitive representation of information. It will express these variables in terms of quantity and quality. The comparative descriptive approach is a research method that examines a phenomenon in terms of its features, quantity, and changes (**Atwi Jawdat, 2007, p. 173).**

The descriptive methodology is the most common, widespread, and widely employed approach in educational, psychological, and social studies. It focuses on describing and interpreting the phenomenon under study. The descriptive methodology involves gathering qualitative and quantitative data about the phenomenon of interest in order to analyze and interpret it, conclude, understand its nature and characteristics, identify relationships among its elements and with other phenomena, and make generalizations (**Hassan Mohammed Abdul Basit, 1990, p. 198).**

2.2. The Study Population:

The current research population consists of fifth-year students aged between 10 and 11 years who are studying in public primary schools under the Ministry of Education in the Directorate of Education in Laghouat Province. The total number of students is 150, distributed among 10 primary schools. The selection of students was based on various reasons, which can be explained as follows:

Fifth-year students, aged between 10 and 11 years, were chosen because, at this level of education, students can comprehend reading and understand test instructions and apply them as required.

Reading comprehension difficulties may have developed in some students due to learning practices and principles, which can be observed and manifested at this age.

2.3.Study Sample:

Samples have become essential in many theoretical and scientific studies, as researchers rely on them to save time, effort, and money. This study relied on two types of samples: random samples and purposive samples. The random sample was related to the sample of typical students, who were selected randomly from third and fourth-year students. The purposive sample was related to students who experience reading comprehension difficulties, and they were selected intentionally using the Diagnostic Assessment Battery for Learning Difficulties (**Fathi Mustafa Al-Ziyat**).

The primary research sample for this study was selected from primary educational institutions, including ten primary schools such as Mohamed Kribiz School, Al-Sadikia School, Al-Rek Aissa School, etc., divided according to the direction (south, north, east, west). The total number of students is 100, with 50 typical students and 50 students with reading comprehension difficulties. The following table illustrates this:

Table Number (01): Illustrates spatial delimitations based on names

Primary schools	Males Percentage	Females Percentage	Total
Mohamed Kribiz	7%	6%	%13
Al Rek Aissa	5%	6%	%11
Al Wiam	4%	4%	%8
Ahmed Chatta	5%	5%	%10
Al Mosalaha	4%	4%	%8
Chouireb	4%	4%	%8
Mohamed Oubati	7%	8%	%15
Choucha Al-Bouti	5%	3%	%8
Tayeb Ibrahim	4%	6%	%10
Bougurine	5%	4%	%9
Total	50%	50%	100%

Based on the table above, it is evident that the ratios varied among each primary school. We selected 5 students from each school from the typical group, resulting in a total of 50 students, representing 50% of the sample. The selection of students with reading comprehension difficulties was based on the applied tests.

The total number of males in the educational institutions was 50 students, representing 50% of the total, while the total number of females in the educational institutions was 50 students, also representing 50% of the total. This makes the overall ratio 100%, with 50 students with reading comprehension difficulties and 50 typical students. This applies to the total value.

2.4. Study Tools:

In this study, we employed two clinical research tools:

2.4.1. Cognitive Representation of Information Scale: Defining the concept of the triadic models of cognitive representation of information for the purpose of determining the concept of cognitive representation models of information. The researcher reviewed the theoretical framework and relevant literature on this concept, which was presented in Section Two. The definition and scale by Oussama Al-Sayed were used for the triadic models of cognitive representation, which defines it as the method or approach used by students to deal with the information they acquire and connect it with what is stored in their memory.

- **Description and Correction of the Scale:**

The scale consists of three models: the network model, the spreading activation model, and the feature comparison model. Each model contains 10 items, and for each item, there are three alternatives, and the examinee is required to choose the alternative that applies to them.

- **Psychometric Properties of the Scale:**

The scale's psychometric properties were calculated by the scale's author, Ayam Wahab Razaq Al-Birmani, in 2015, using various methods, as follows:

- **Face Validity:**

To establish face validity for the Cognitive Representation Models of the Information scale, the researcher obtained opinions from some expert referees in educational psychology. This was done to verify the psychometric properties of the scale. The agreement percentage on the arbitration items ranged from 83% to 100%.

- **Item Validity:**

Relationship between Item Score and Total Score:

The statistical criterion employed for significance was the Elbe criterion. If an item obtained a score of 0.19 or higher, it was considered a distinguishing item. The researcher utilized the Pearson correlation coefficient to extract the correlation between each item score and the total score of the scale. Items with low correlation cannot be relied upon as they measure a completely different function compared to the other items.Table 1 illustrates this.

Table Number (02): illustrates the relationship between the item score and the total score of the Cognitive Representation Models of Information scale.

Item Nº	**Correlation Coefficient of Item Score with Total Score**	**Item Nº**	**Correlation Coefficient of Item Score with Total Score**
1	0,84	16	0,82
2	0,85	17	0,82
3	0,85	18	0.83
4	0,85	19	0.83
5	0,85	20	0.79
6	0,85	21	0.83
7	0,85	22	0,57
8	0,85	23	0,68
9	0,85	24	0,48
10	0,85	25	0,69
11	0,63	26	0,46
12	0,81	27	0,33

13	0,81	28	0,75
14	0,82	29	0,19
15	0.83	30	0,64

Scale Reliability: The scale's reliability was calculated as follows:

Cronbach's Alpha as an Internal Consistency Coefficient:

To determine the reliability using this method, a reliability sample of 60 male and female students was selected from secondary schools in Babel Governorate. The reliability coefficients for the network model, spreading activation model, feature comparison model, and the scale as a whole were calculated as follows: network model (0.86), spreading activation model (0.85), feature comparison model (0.83), and overall scale (0.92).

2.4.2. Cognitive Style Verbal and Conceptual Scale: (Bidaa Salah Hassan Al-Tai, 2017)

The Verbal and Conceptual Cognitive Style scale items were formulated as situations, each with two alternatives, referred to as the forced-choice style, presented as statements where one represents the Verbal style and the other represents the Conceptualstyle. Respondents choose one of the alternatives for their answer: (A) measuring the Verbal cognitive style, scored as (1), and alternative (B) measuring the Conceptual cognitive style, scored as (0).

In this way, the total score for the respondent is calculated. The Cognitive Style Verbal and Conceptual Scale (**Abd, 2014**) comprises 44 situations. The total score is then calculated by adding the hypothetical mean (22). A higher score indicates a Verbal cognitive style, while a lower score indicates an conceptualcognitive style.

3. Study Results:

After applying the test to the studied sample and processing the data using the Statistical Package for the Social Sciences (SPSS), the results were presented and analyzed. Each hypothesis of the study was subjected to appropriate statistical analysis.

3.1.Presentation of the First Hypothesis Results: The level of cognitive representation of information among a sample of fifth-year students with reading comprehension difficulties was found to be low. To answer this question, the scores of the sample individuals on the cognitive representation scale were analyzed. The mean and standard deviation were employed to determine the level of representation, whether it was low or high.

Table Number (03): displays the means and standard deviations of the study sample's scores on the dimensions of the cognitive representation scale.

Scale	sample/Difficulties in understanding	Hypothetical mean	Mean	sd	df	value.t	sig	level
Cognitive representation	**50**	**78**	**57.71**	**7.8951**	**49**	**11.66-**	**.000**	**low**

It is evident from the above table that the mean is 57.71, while the standard deviation is 17.895. The degree of freedom is 49, and the t-value is 11.66 at a significance level of 0.00. Therefore, the hypothesis stating that the level of cognitive representation of information is low among a sample of individuals with reading comprehension difficulties has been confirmed.

The researcher interprets this result based on the fact that cognitive representation is essential for all types of human knowledge. Information derived from sensory experiences is encoded and connected to stored items in the brain. It is a process of extracting information from sensory experiences and integrating it into memory. Each individual represents environmental stimuli differently from others, which can cause some difficulties in communication. What we see, smell, or taste and how we represent it in our memory is different from others. However, the degree of similarity in our representation of environmental stimuli is sufficient to help us coexist. The topic of internal cognitive representation has drawn the attention of scientists and researchers in cognitive psychology and is one of the prominent subjects in this field (**Mohammed & Issa, 2011, p. 29**).

The reason individuals with reading comprehension difficulties recorded a decrease in cognitive representation of the read information is that reading is the process of transforming written symbols into meanings and ideas through oral expression using an analytical approach. Therefore, the main elements of

reading are the written symbol, the written meaning, oral pronunciation in reading aloud, and direct access to the meaning in reading.

3.2. Presentation of the Second Hypothesis Results: The nature of the verbal and conceptual cognitive style among a sample of fifth-year students with reading comprehension difficulties is negative. To answer this question, the responses of the sample individuals on the verbal and visual cognitive style scale were analyzed. The mean is considered a criterion for determining the nature of the cognitive style, whether it is positive or negative.

Table Number (04): illustrates the means and standard deviations of the study sample's estimates on the dimensions of the cognitive style scale.

Scale	Sample/Difficulties in understanding	Hypothetical mean	Mean	sd	df	value.t	sig	Nature
Cognitive/verbal-conceptual style	**50**	**20**	**17.71**	**1.3951**	**49**	**09.07-**	**.000**	**negative**

According to the table above, it is evident that the mean reached 17.71, while the standard deviation was 17.895. The degree of freedom was 49, and the obtained t-value was -09.07 at a significance level of 0.00. Thus, the hypothesis has been confirmed.

The researcher attributes this result to the fact that fifth-year students with reading comprehension difficulties tend to lean towards a verbal cognitive style rather than a visual one, which can be attributed to cognitive representation issues. Understanding the method or style through which knowledge is represented contributes to the ease, accuracy, efficiency, and effectiveness of cognitive tasks. Additionally, understanding the factors behind effective cognitive representation directly contributes to comprehension processes and conceptual techniques.

The researcher believes that there is an interactive relationship between the reader and the written text in reading comprehension. This is supported by Taylor's assertion that reading is an integrated interactive process, where the reader perceives the text visually, thinks about it, interprets it based on their background and experiences, and generates ideas, generalizations, and practical applications (**Habibullah, 2009, p. 12**). Therefore, the reader is not passive but rather needs to interact with what they read. The mind consists of interconnected cognitive relationships rather than isolated units that are unrelated. This implies that comprehension requires the use of language in the mental processes undertaken by the reader to access meanings. In other words, the reader can only think or comprehend meanings if they are able to understand the words and linguistic structures contained in the text they are reading.

Presentation of the results of the third hypothesis: The level of cognitive representation of information among a sample of fifth-year primary students with normal reading abilities is high. To answer this question, the responses of the sample individuals on the cognitive representation of information scale were tabulated. To determine the level of cognitive representation of information, the arithmetic mean is considered as the criterion for determining the level.

Table Number (05): illustrates the mean scores and standard deviations for the assessments of individuals in the normal study sample on the dimensions of the Cognitive Representation Scale.

Scale	Sample/Typical	Hypothetical mean	Mean	sd	df	value.t	sig	level
Information Cognitive Representation	**50**	**78**	**108.09**	**44.89**	**49**	**18.176**	**.000**	**high**

According to the table above, it is evident that the mean reached 108.09, while the standard deviation was 44.89. The degree of freedom was 49, and the obtained t-value was 18.176 at a significance level of 0.00. Thus, the hypothesis has been confirmed.

This result can be interpreted as regular students having a high ability in cognitive representation of information. The individuals in the sample demonstrate the ability to organize and use information about the world using a network of links between concepts, ideas, and information in their memory. Encoding process of the information acquired by the individual and connecting it to their existing knowledge in their cognitive

structure. This is what made the difference clear between the regular sample and students with comprehension difficulties, with the degree in favor of regular students.

Presentation of the results of the fourth hypothesis: The nature of the verbal cognitive-conceptual style among a sample of fifth-year students is positive. To answer this question, the scores of the sample individuals' responses were recorded on the Cognitive Style Scale, and to determine the nature of the cognitive style, the mean is considered a criterion for its determination.

Table Number (06): presents the means and standard deviations of the estimates of the regular study sample on the dimensions of the Cognitive Style Scale.

Scale	Sample/Difficulties in understanding	Hypothetical mean	Mean	sd	df	value.t	sig	Nature
Cognitive/verbal-conceptual style	**50**	**20**	**37.71**	**27.325**	**49**	**09.07**	**.000**	**positive**

According to the table above, it is evident that the mean reached 37.71, while the standard deviation was 27.71. The degree of freedom was 49, and the obtained t-value was 09.07 at a significance level of 0.00. Thus, the hypothesis has been confirmed.

This result can be interpreted as the sample individuals possessing a complete verbal-conceptual cognitive style. This is attributed to their cognitive ability to represent information, which involves inputting, comprehending, and retaining meanings and ideas to become part of an individual's cognitive structure. This cognitive structure represents an accumulative building that interacts with the individual's information, knowledge, and direct and indirect experiences, which supports their ability to create effective integration of information categories. Cognitive styles operate based on the dual coding model proposed by Paivio, which assumes the existence of two representational systems: one based on visual conceptual and the other based on verbal coding. This complete cognitive representation of information resulted in differences in favor of regular students over those with comprehension difficulties.

Presentation of the results of the fifth hypothesis: There are statistically significant differences in cognitive representation of information and cognitive style (verbal and conceptual) among a sample of fifth-year students with difficulties in reading comprehension. To answer this question, the scores of the sample individuals' responses were recorded on the Cognitive Representation Scale and the Cognitive Style Scale to reveal the differences between them.

Table Number (07): illustrates the significance of differences among the study sample individuals on the dimensions of the Cognitive Style and Cognitive Representation Scales.

Scale	Sample	Mean	sd	valuet	df	Significance level
Cognitive representation	**50**	**58.84**	**25.556**	**0.204**	**49**	**0.839**
Cognitive style		**57.80**	**25.423**			

Upon reviewing the results of the fifth hypothesis, the findings indicated no statistically significant differences at a significance level of α=0.05 in the Cognitive Representation Scale and the Verbal-Conceptual Cognitive Style Scale. The results showed that the mean differences among the responses of the study sample individuals on these measures were very close. The mean for cognitive representation was 58.84, while for the cognitive style, it was 57.80. The standard deviation for cognitive representation was 25.556, while for the cognitive style, it was 25.423. These values were not statistically significant at the 0.05 level.

The interpretation of these results suggests that individuals in the sample who have difficulties in reading comprehension may lack the ability for effective cognitive representation of information. Understanding the material requires the presence of both the verbal and conceptual cognitive styles, where the meaning is complete and connected to previous experiences. The cognitive style refers to specific patterns of generality, where an individual responds using one approach in one situation and employs specific features in other situations. Cognitive style is the preferred way an individual organizes and perceives their surroundings, organizes their experiences in memory, and retrieves stored information. Thus, individual differences lie in perception, imagination, memory, and thinking, as well as their association with variations in comprehension, retention, transformation, information use, and self-understanding (**Nadia, 1982, p. 110).**

Deep processing of environmental information relies on the principles of optimal and more accessible perception. This preferred pattern is automatically selected by the cognitive system in dealing with information and sometimes results in conceptual linking. This imaginative, fictional, or artificial linkage is a form of cognitive adaptation for perceptual proficiency. The cognitive system usesdifferent strategies to enhance good perception, ease, accuracy, or anticipation under certain conditions. The cognitive system completes deficiencies, for example, in shapes that are believed to require additions for better proficiency. Sometimes, it works the other way around and deletes specific attributes, then classifies, saying that this drink resembles orange juice but is more skillful, thus highlighting a specific attribute to promoteconceptual perception. The process of linking, which is not necessarily realistic, may co-occur synonymously, sequentially, similarly, regularly, or irregularly, but it never means that the two cognitive patterns or forms are inherently linked. However, we perceive this linkage for the purpose of simplifying and improving the cognitive process in dealing with stimuli, with the minimum effort and time required for good conceptual perception (**Abbas, 2020, p. 465).**

Presentation of the results of the Seventh Hypothesis: Reminder of the hypothesis: There is a statistically significant relationship between cognitive representation of information and the verbal-conceptual cognitive style among a sample of fifth-year students with and without reading comprehension difficulties. To verify the validity of this hypothesis, the researcher calculated the Pearson correlation coefficient between cognitive representation and cognitive style. The tables below present the results obtained from the statistical analysis.

Table Number (08): illustrates the relationship between the cognitive style scale and cognitive representation among the sample individuals.

**** Significant at 0.01 * Significant at 0.05**	**Sample**	**Mean**	**sd**	**Correlation coefficient**
Cognitive representation	**100**	**57.719**	**17.89**	**0.45**
Cognitive style		**89.09**	**14.90**	

Based on the table above, it is evident that there is a statistically significant correlation at a significance level of 0.01 between the cognitive representation of information and the verbal-conceptual cognitive style among the sample individuals, with a correlation coefficient of 0.45. Therefore, the hypothesis stating the presence of a correlation has been confirmed.

Conclusion:

In conclusion, through the theoretical perspective and the results obtained in our current study, it is clear that reading comprehension is directly related to the cognitive representation of information. It mentally connects concepts and shapes, interpreting the information received from the environment in the language it processes. This is supported by Solso's viewpoint, where he affirms that mental representation is a fundamental process used by students as a learning style or pattern, whether it is the (Network) model, the (spreading activation) model, or the (feature comparison) model (Solso, 1995). The verbal-conceptual cognitive style is a cognitive process on which the reader relies to connect auditory and visual stimuli, forming cognitive and linguistic meaning.

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