The Effect of Information Type and its Presentation Method on the Performance Competency of the Semantic Memory: An Experimental Study

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Abstract

The current study attempts to explore the influence of the information type and its presentation method on the performance competency of the semantic memory of a sample of male and female university students in Kuwait University.

The tools of the study include two batteries: the first is the tests battery of semantic memory and the other one is the secondary tests for controlling the extraneous variables. The study was administered on a sample, which consisted of 400 Kuwaiti students (200 males/200 Females) of various departments of the Faculty of Social Sciences, Kuwait University). The two batteries were administered the students individually in the experimental psychology laboratory in the faculty of social sciences. In addition, the study concludes that there are statistically significant differences between males and females in terms of the semantic memory.

Findings of the study indicate that whereas there is a high predictive ability regarding the information type and presentation method for word recalling (a) and word recalling words, there is not a predictive ability of the type of information and presentation method for image classification for objects locations for the semantic memory for the males and females of the study and the total sample.

Key words: Semantic memory, information type, information presentation method

دراسة تجريبية في أثر نوع المعلومات وطريقة تقديمها في كفاءة أداء الذاكرة الدلالية

أمثال هادي الحويلة

سعت هذه الدراسة إلى التعرف على تأثير نوع المعلومات، وطريقه تقديمها، علي كفاءة أداء الذاكرة الدلالية لدى عينة من طلاب وطالبات الجامعة الكويتيين.

شملت أدوات الدراسة بطاريتين، هما بطارية الاختبارات الذاكرة الدلاليــة وبطارية الاختبارات الفرعية لضبط المتغيرات الدخيلة وطبقت على عينة الدراسة المكونة من 400 من طلاب وطالبات جامعة الكويت بواقع (200 ذكور / 200 إناث) في مختلف التخصصات الموجودة في كلية العلوم الاجتماعية من جامعــة الكويت في دولة الكويت. وتم التطبيق عليهم فردياً في مختبر علم النفس التجريبي بكلية العلوم الاجتماعية.

وتوصلت الدراسة إلى أن المشاركين في حالة تعرضهم للمعلومات الشكلية يكونون أكثر كفاءة في أداء الذاكرة الدلالية. كما أن المشاركين في حالة تقــديم المعلومات اللفظية لهم بطريقة بصرية كانوا أكثر كفاءة في أداء الذاكرة الدلالية، كما تبين وجود فروق دالة بين الذكور والإناث في الذاكرة الدلالية.

كما تبين وجود قدرة تنبؤية مرتفعة لنوع المعلومة وطريقة تقديمها باستدعاء الكلمات(أ) وباستدعاء الكلمات(ب)، وعدم وجود قدرة تنبؤية لنــوع المعلومــة وطريقة تقديمها على كل من تصنيف الصور، وتحديد أماكن الأشــياء للــذاكرة الدلالية وذلك عند عينة الذكور والإناث، والعينة الكلية.

Introduction

The efforts of Ebbinghaus and other researchers who came after him concerning memory research have led to the development of the theory of information processing and its designs since the late 1940s of the last century until now. Consequently, a number of cognitive and technological interpretations and systems have appeared; the most common of all, at the present time, are computer systems, multimedia, and information webs at a larger scale. All the previous factors have greatly contributed a lot of developments and information to the cognitive field *(Gardiner, 2006: 930-948).*

The clearest images of conceptual development are perhaps the ones related to the theoretical and practical efforts concerning the ideas about the multi-system memory, particularly with regard to the concepts of semantic memory.

Semantic memory or the memory of meanings (1)- one of the fundamental interests of the discipline of cognitive psychology- occupies an important place, as it is held responsible for storing and retrieving the names of people, relatives and living organisms. It is considered as the database of the brain, as it stores many facts and the places of things till the need for such information arises (Anna, et al, 2005, p 1484).

It is also a component of the operational memory, by which the words meanings or connotations, concepts, and information about the outside world and the surrounding environment are processed and stored.

Robert Saulsso (1996, p. 247) refers to what he calls "semantic meanings memory" (or semantic memory), as the means by which words, concepts, rules, and abstract ideas are remembered and, therefore, it is essential for the use of language.

Tolving also describes it as a mental Encyclopedia (2), which organizes the information that the individual processes using words, verbal symbols, their meanings, the relationships among them, the rules that govern them, and the formulas (3) in which they manifest themselves. These factors are necessary for processing all of these

symbols, concepts and relationships. Thus, semantic memory (or the memory of meanings) is not a record of the input characteristics that can be perceived mentally or physically, but is rather cognitive references (1) of the signals that represent its symbolic input.

What adds new dimension to our knowledge of semantic memory is that it consists of verbal information which is stored linguistically or symbolically, and that it has its own operational rules. Examples of semantic memory components are: mathematics, chemical equations, and theories of any scientific knowledge, language rules, and the facts which are not related either to time or to place. This means that the components of this memory don not include present or past events, like personal memories for example, because its information are of cognitive nature and it is based on the concepts, facts, principles, rules and the like of cognitive connotations (Alice, 2003, p.483).

The relationship between knowledge and semantic memory is almost the same as that between learning input and output, since knowledge, its qualitative and quantitative characteristics and its included concepts, facts, rules, laws, and theories constitute the cognitive units which form the memory of meanings. This memory, by its turn, is liable to many of the organizational foundations or patterns that lie behind the individual's ability to receive and process information (Anna, et al, 2005, p 1483).

The relationship between knowledge and semantic memory reflects the effectiveness of the cognitive representation and active representations of the long-term memory. Moreover, semantic memory includes the stable cognitive units and the units with high correlations related to estimating and procedural knowledge. In addition, semantic memory also influences the encryption processes activity in operational memory (Zayyat, 1998, p. 151). The relationship between knowledge and semantic memory has an effect on the activity competency effectiveness of processing information; this effect is shown through the following:

The consequence of the lack of effectiveness or efficiency of knowledge representation is that most of the cognitive units and concepts that are acquired in semantic memory remain floating or

traveling and lack absorption and placement.

• As a result of not creating deliberate linkages between the cognitive units included in semantic memory, these units start to fade and decrease through loss or forgetfulness, and their correlations and effects start to decompose during the information processing .

In general, semantic memory stores, organizes, employs, derives and recovers knowledge without a specific reference to how it was acquired. Cognitive psychologists use the concept or the term of semantic memory in its broad sense to include the individual's cognitive encyclopedia, its derivatives, meanings and structural knowledge with its descriptive and quantitative characteristics *(Al-Zayat, 1998, p. 151)*

Hence, the present study came to demonstrate the importance of semantic memory in cognitive performance, especially if the information types and its methods of presentation and reception are different.

Significance of the Study

Al-Zayat (1998, p. 152) points out that the relationship between knowledge and semantic memory affects the competence of information preparation and processing, resulting in diminution of semantic memory content and the factual events and the shrinkage of its units. This involves that the cognitive construction becomes shallow and weak (Al-Zayat, 1998, p. 152). Thus, we can conclude that the relationship between knowledge and semantic memory is a mutual one based on cause and effect.

Though semantic memory has lately become one of the most recent scientific problems of psychology, which has received much attention and study, it has not achieved a proportionate research development. The importance of this memory is due to its use in many scientific areas and fields, including those sciences that seem to be far from psychology such as the communication technology and the computer, using a variety of accesses.

1) The development of the techniques of electronic calculators associated with modeling the memory processes has revealed the complexity of these processes. Till recently, memory was considered a

process of simple impression, retention, and recall of effects. But now these perceptions have been proved insufficient and inaccurate, and therefore the human memory scholars regard memorizing (input) and retention (storage) and retrieval (output) as complex processes of information processing, each of which consists of a number of stages which are close in their nature to that of the cognitive activity, which is extremely complex and highly regulated. This radical change that occurred to our perception of memory has led to the more accurate study of its construction and it provided a more detailed analysis of its working mechanisms, types and fields.

Semantic memory also occupies an essential position in the human life as it is the crucial factor in man's progress and development, as without memory, man seems as if (reborn in every moment); keeping in mind that the role of memory is not limited to registering and storing what took place in the past, but its role is also highlighted in every vital action we want to do at the present time because the action , its happening and achieving its objectives necessarily require the retention of every element to link each component with the previous and the following ones, .Without such a link and without maintaining the action unity and the unity of the past, present and future action chains, learning and growth would not be possible (Qasim, 2003).

The researcher believes that the significance of the study of semantic memory is due to:

2) The second reason behind the revitalization of interest in the study of semantic memory is due to some achievements of the previous foreign studies in the last ten years which have examined the biological and cognitive nature of the information that is produced in this memory by different influences, as the biological studies done at the molecular level allowed us to reach a series of facts that indicated the possibility of the DNA (RNA) to play a crucial role in the processes of recording and archiving information. These studies confirmed the presence of a specialized brain function that receives and analyses information and compares the newly received information with the previously stored ones. They have contributed to

the understanding of the role of these neural processes in the memory processes, particularly the semantic ones. Moreover, the cognitive and psychological studies which were carried on the nature of information allowed us to find results and facts that were very similar to previous ones. This may be due to the fact that the memory of events and the indications were viewed through patients suffering from lack of brain functions by (Tulvenj) and that these studies were not applied to normal people.

In spite of the presence of some distinctive attempts made by the researchers to determine the two types of memory receiving interest in the current study, there is still a need for further studies, which care for the effect of the information types and presentation methods on many different cognitive variables such as education, attention and concentration, etc., especially since a large number of studies have reached contradictory results; some studies confirmed the competency of retrieving information from semantic memory, whether verbal or graphical (Pascale, et al, 2007) and (Gainatti, 2006), whereas another number of studies confirmed the competency of other types of memory such as the realistic memory whose efficiency significantly exceeds semantic memory (Shoben and Tulving, 1982,1985) (Underwood et al., 1978., Neely, 1983).

Moreover, the results of studies on the information type (verbal and non-verbal) and the presentation method (audio and video) were contradictory, as whereas Sian assured (Sian, 2002) the distinction of the audio method of semantic memory, the study of Judith and Jack Martin (Judith, & Jack, 1994) concluded that the visual materials can be embodied more than the verbal ones.

In the light of this discrepancy in the results of the studies, and the importance given to the theory of information processing in understanding the cognitive activity, and the new scientific perceptions it presented, the importance of studying the performance types of semantic memory, especially with regard to diversity of the types, methods and contents of the cognitive information, provided to individuals in rationed, experimental situations becomes so clear. This is confirmed by the nature of the problem of concern in the current study, which we discuss as follows:

Problem of the Study:

The study problem is presented in an attempt to answer the following question: to what extent do the different information types, the presentation methods, and its content nature, affect performance competency of semantic memory, amongst a sample of males and females students at Kuwait University?

A series of questions, that we will try to answer, stems from the basic question. These are as follows:

1. Does semantic memory competency increase in the case of the audio information more than the non-verbal one?

2. Does semantic memory competency increase in the audio presentation of the verbal information more than the visual one?

3. Does semantic memory competency decrease in the case of the audio presentation of the non-verbal information more the visual one?

4. Are there any differences between male and female university students' performances on semantic memory tests?

5. Which of the previous independent variables – information type and presentation methods - is the most efficient predictor of semantic memory competency in males and females?

Objectives of the Study

This research aims at studying the effect of the information type, and presentation methods, on performance competency of semantic memory, in a sample of male and female students in Kuwaiti university.

A number of other sub-objectives stems from the main objective including :

1 .Identifying semantic memory competency in the case of the verbal information and the non-verbal one.

2 .Identifying semantic memory competency in the audio presentation of the verbal information and in the case of the visual one.

3. Identifying semantic memory competency in the case of the audio presentation of the non-verbal information and in the case of the visual one

4. Revealing the differences between male and female university students' performances on semantic memory tests.

5. Identifying the previous independent variables – information type

and presentation methods - is the most efficient predictor of semantic memory competency in males and females?

Theoretical Background:

There are several definitions of semantic memory that are overlapping each other, making the definitions of many of the researchers neither accurate nor clear. Starting from the mid-eighties, a classification movement of memory types and their definitions started to take a more positive form and to exert much effort to try to distinguish between the so-called semantic memory, and factual events memory With this classification movement, a number of researchers emphasized that the capacity of semantic memory is very enormous, to the extent that an educated person's semantic memory may reach Tens of thousands of words (Alexander, et al, 2006, p.42).

According to Korsini encyclopedia (Corsini, 1994, p.356), semantic memory relates to the general knowledge of facts, concepts and information which aren't associated with a place or a time, therefore it is essential for knowing that Paris is the capital of France (for example), but it doesn't recall any of the individual memories about this country, which needs another memory known as (factual events memory) which we are going to discuss later.

Robert Saulsso (2000, p. 247) defines it as the means by which words, concepts, rules, and abstract ideas are remembered, therefore, it is necessary for the use of language; for example, when we use the word "blue" we may not refer to a particular event in our memory that has already used this word, but on the contrary we refer to the general meaning of the word. We often recall in our daily life information from semantic memory to use in dialogue, solving-problems, or reading a book. Our ability to process a variety of information in quick succession is due to high competency of the recalling process and good organization of information in semantic memory.

AS for Neeberj Lars (Lars, et al, 2003, p.371), he defines semantic memory through its functional role as it assists the human beings and the non-human creatures to acquire information and knowledge about the world in which they live.

Elizabeth Wigeleski (Elizabeth Wigeleski, 2004, p. 106) defines semantic memory as "a permanent system that signifies the

individual's general information of about the facts of the world, concepts, and words meanings.This knowledge is stored in certain neurological areas ; the damage in these areas of nerves, appears in the older ages and is known as Alzheimer's disease that is associated with a weakness in naming and describing things ."

In a brief definition of semantic memory, Ganinatti defines it , as" it is what relates to facts, ideas, words, concepts and rules as the information it cares about is not as personal as the experiences memory, moreover its information is not dated in a specific the given time context. (Ganinatti, 2006, pp. 577-59)

Through the researcher's presentation of the classifications of the previous concepts of semantic memory, she believes that some definitions discussed semantic memory components ,another group dealt with the functions and mechanisms of semantic memory, whereas the last one tried to define it through a combination of components and functions. The researcher did not find a single definition that tried to combine all of these Categories what made her review and classify each of these definitions.

Based on the above-mentioned,the researcher adopted the following definition of semantic mwemory in this study as "the cognitive function by which the individual recalls symbols , words , concepts , rules , principles, abstract ideas , and language with the aim of resolving the various problems that face him and achieving adjustment and harmony in his life generally. It is related not only to the individual's private subjects but also to the world around him.

B – Theoretical models explaining semantic memory.

The contemporary cognitive psychological researches aiming at studying the memory and its composition in general as well as its organization of the information within it in particular have increased. The thing that concerns us here is to present the perceptions and theoretical models that explain semantic memory work, organization and composition on one hand and, the information composition and organization on the other hand. The meanings or implications of these models may vary from one study to another what may justify the search for similarities and differences in their interpretation of the

operating system of semantic memory (Houstan and Mandler, 1981)

There is a range of theoretical models that tried to explain the regulatory processes of semantic memory, and how does it perform its functions, namely:

1. The Feature Comparison Models

Feature Comparison Models is considered one of the presumed logical methods for organizing semantic memory through the features lists of objects and concepts. According to this model, the concepts are stored in the memory in accordance with their distinctive features associated with it *(Lambon, et al, 1995, pp.1251-1260)*

The process of determining these concepts is divided into two necessary phases to judge it. Before we discuss this process of determining these concepts, we need to first discuss the structure of semantic memory as seen by Smith *(Smith, 1988))* through features lists. According to the comparison model, concepts are stored in memory on the basis of a list of the special features associated with it (Smith, Shoben, Rips, 1974) For example, if we review the features list often associated with cats , we find the following: - it has fur and mustaches, it is a four-legged, it meows and it has a tail. In the light of these features which are associated with concept, conclusions about it could be made to an extent that it can be identified (*Al-Zayat, 1998, p. 153)*

As for the decision-making process and according to Smith (Smith, 1988) and his colleagues, it becomes necessary when people need to ask a question such as: "Is the cat an animal?" .In the first stage of the decision-making process ,people compares all of the distinctive features of the concept (cat), and then decide that it is an animal.

Smith and his colleagues believe that the features used in the model of comparison are either distinctive features or characterizing ones. The Smith (Smith, 1988) and his colleagues' features are those ones that may be necessary to refer to the implications and meanings produced by the concept. For example, the specific features of the ostrich are that it's a huge-body bird that doesn't fly, while its

distinctive features are those features that could be described but it is not a necessary or conclusive in deducing the concept, for example, the characterizing ones of the ostrich are that: it has legs, and neck and its tall, and it lays eggs (Timothy and McNamara, 2005, p12

Network models:

Operational network model means the spreading distribution of a specific concept and a number of concepts associated with it to form a structure or a combination based on the connections or the associations of this structure *(Timothy and McNamara, 2005, p11).*

The operational network model of semantic memory is an associative organization which connects the memory concepts through many connections. The meaning of a specific concept, such as the sun, depends on the concepts related to or associated with it through the meeting points across the operational network *(Al-Zayat, 1998, p.158).*

Hence, the networking concepts assume that the words which are stored in semantic meaning memory are linked to each other through links or assumptions in a complex network system. In its fundamental form, this relationship takes the following shape: (x) is (y), and when we apply this on the following example, we say that redbreast is a bird (X is y).The information storage is also associated with a complex network of relationships, for example the word "bird" and the word "sparrow" are stored according to their relationship which is,"a sparrow is a bird" (Fatima, 2005, p. 42).

3- Examples approach:

This approach is based upon the assumption that we first learn a few qualitative examples of the concept, and then we classify it in the light of the proximity or distance from these qualitative examples. Let's consider, for example, that we have read four models, each describing a frustrated person. When we read about the fifth person's case, we can decide whether that person falls under the description of a frustrated person's characteristics or not in the light of what was deduced from these characteristics, or descriptions ;that's by establishing generalizations(Eleanor, and Christopher, 2004, p.177) According to this approach ,the individuals do not tend to abstracting

the concept, but their learning here relies on the comparison between the sensed characteristics in the light of the specific qualitative examples *(Dalrymple --Alford & Marmurek, 1999).*

4. The prototype approach:

In the light of the theory proposed by the "Eleanor Roche" (Eleanor, 1973) the classifications are organized in accordance with the prototype in the sense of profiling the paragraphs which represent the best examples of certain classifications (*Zayat, 1998, p. 165).*

According to that approach, people try to decide whether the paragraph follows the prototype or the standard classification or not. If the paragraph is similar to the prototype classification or the prototype, it is to be included. But if the paragraph is different enough, it is to be developed or included under another classification when it is more consistent with the pattern, namely with the other classification pattern (Smith, 1988).

The prototype approach has a significant effect on the cognitive psychology as several psychologists used many of the prototypes on which people are classified such as: aggressive, Heady, deliberate, introvert, extrovert, imaginative, romantic, etc. *(Russell, 1990).*

5. Classification levels model:

Classification levels represent the second principal dimension in the theory of "Rosch ", where this dimension explains the different levels of structures of Semantic categories. Some of the classifications levels are called: Super ordinate-level classifications which mean a higher level or more general one. Examples of this level are: animals, plants, minerals, vitamins, furniture insects.... Etc. (Cohen and Gillian, 1989),

On the other hand, some other classifications are called basic level classifications, a more specific or qualitative levels. Examples of this level include: pen, cat, dog, glasses, book, cup, spoon and a bag. Finally, the under-qualitative Classification levels, which are less general and more qualitative including examples like the desk chair, Philips microphone, Parker pen, and others. It is noted that the basic

levels of categorization involve specific characteristics *(Al-Zayat, 1998, p. 166).*

There are three other models that touched the information interpretation within semantic memory:

6. The bob model:

According to the bob model the concepts represented by words are held in the memory in the form of an organized formula representing a collection or a cluster of the similar or related paragraphs; for example, the similar vocabulary are stored together so all the names of birds , animals, presidents capitals and scientists are kept together. *(Sankar, et al, 2001)*

The early Studies concerning the memory organization confirm that the concepts are clustered according to the patterns of relationships that govern the process of collection or clustering within the memory based on the common characteristics between these concepts or elements which are determined through the individual's perception formulas associated with the cognitive construction and its content for the individual *(Fatima, 2005, p. 45).*

7. Subjective arrangement model for information

It means that depending upon his categorizing tendency, a person deliberately organizes the information that comes before him whether it was a group of words or other forms subjectively what appears through his remembering certain words with a certain degree of consistency, although they were presented to him randomly *(Houstan, 1979).*

Subjective organization refers to recovering certain paragraphs although they wer randomly presented to him, and during the recall process. According to Tulvenj (1982), the person is free to use the organization strategy that he prefers as this strategy reflects his subjective tendency in organizing information (Timothy & McNamara, 2005, p12).

These strategies vary from one person to another, as some uses the structure of visual images for stimuli, others may write a story, and a third group may link between the paragraphs that are similar in

content or structure, a fourth group may use a single or distinctive strategy of a subjective nature *(Dalrymple & Marmurek, 1999)*

Tulvenj (1962) is considered the first one to use the concept of subjective organization to estimate the recalling processes within the memory through hs experiments to measure the effect of information subjective-organization on the two processes of memorizing and recalling, where the participants received a long list of paragraphs which were provided one after another .The participants did not have any prior classification of these paragraphs, and then they were asked to recall the largest possible number of these paragraphs in any way they want .Each time the list was submitted in a new random way which differed from its previous one.

8 - Advanced organization model of semantic memory:

A lot of researchers who studied the lexical memory believe that words are stored in structures that take the shape of a hierarchy or a matrix. Broadbent and Cooper (Cooper & Broadbent 1978) compared three methods of displaying lists of words made up of sixteen words as follows:

A. Presenting word lists in a hierarchy (graded).

B. Presenting words randomly.

C. Presenting words in a matrix.
   The participants were then asked to recall the largest possible number of words they could. The study found that the rate of words recall presented in the hierarchical form was greater than that presented in the matrix form, and the difference between the two rates was statistically significant. It was also found that the rates of words recall in a hierarchy or matrix were superior to the words that were presented randomly and in an indiscriminate manner. The differences between these two were statistically significant *(Zayat, 1998, p. 365).*

The researchers interpreted these results by believing that the words belonging to a particular organization whether in the form of a hierarchy or a matrix retrieve other words in the group through the

idea of associations, and perhaps the idea of associations between the words is more important in facilitating the recall processes than the physical or structural characteristics of words. Moreover the recall of organized information is easier than the recall of the unorganized one, and this is clear through the decrease in the recall rate what refers to the fact that such information becomes a part of the cognitive structure among the participants *(Timothy & McNamara, 2005, p12).*

Previous studies:

A number of studies were carried out in this context including the study of *(Kounios, 1993),* which aimed at exposing the complex processes in semantic memory. In this study, the recall periods of 200 university students have been monitored, after dividing them into two groups; the first group was provided with information through a single arithmetic mechanism and in a slow way , whereas the information was presented to the second group through binary and complex arithmetic mechanism, and in a quick manner. The results have shown that the recall periods at the first group was faster than the recall periods in the second one.

Mohammed Alsaboh (1994) carried out a study of the audio identification and the visual and spatial recalling in a sample of(46) Neurasthenia patients, (47) patients with chronic schizophrenia, and (47)non- patients. They were all Saudi males, ranging in age from 18-42 years . The words audio identification test was applied on them to assess the accuracy of the direct audio memory and Arthur Benton's test was also applied to measure the accuracy of the direct spatial-visual memory. The results showed that the non-patients' results were better than the Neurasthenia patients in their performance of the audio identification test, as well as (Benton's) test whether it was for the right or wrong raw degrees. the non-patients' results were also better than the schizophrenic patients in their performance on the audio test as well as on Benton's test about the raw degrees whether it was right or wrong, whereas the nervous people were better than schizophrenic in their performance on the audio identifying test, as well as Benton test of visual memory for both right or wrong raw degrees, and the audio identification memory of words was less affected by the mental illness, compared to the direct visual memory.

The objective of *Koafestu Koivesto (1995)* study was to uncover the effect of the free recall on semantic memory organization, using a sample of 24 university students divided into two groups; the first were given pairs of connected words , while the second group were given pairs of unconnected words. The study Results showed that the free recall of the connected pairs of words was significantly higher than the group of unconnected words.

As for the study of Toyota (Toyota, 1996),it aimed at identifying the effect of each of the semantic and the Grammatical contexts in the free recall of sentences in the Japanese language, in a sample of 43 university students in Japan, who were provided with sets of sentences; some of which have semantic context, and the others committed to the grammatical rules .The results of the comparison of the recall periods revealed in each of the two types of sentences showed that the period of recalling the sentences with semantic context was shorter than the period of recalling the sentences with the Grammatical context in a statically significant way.

Lazarus (Lazarus et al., 1997) carried out a study on the structures of verbal semantic memory of the persons suffering from anxiety. The study was specifically directed to determining whether these persons are different from the normal persons in recalling the acquired material which activates the verbal semantic memory and a certain behavior as the language or not, and knowing the personality traits associated with it. The study sample consisted of (38) of the Western German university students of both sexes at the psychology department.

The Results showed that those who suffered from anxiety failed to recall much of the information compared to those who weren't suffering from a great degree of anxiety and who were faster and better. It also showed that the personality of people suffering from anxiety is characterized by anger and aggression ,while anxiety-free personality is active, vital and happy, what confirms that the recalling process from semantic memory is associated with anxiety and some personality traits.

The target of Adler's study *(Adler, 1998)* was to trace the effect of calamine on each of (thinking disorders, the functional

memory and semantic memory) in a sample of (10) healthy volunteers using Controls- Double - Blind, Procedure and it was concluded that calamine leads to the production of disturbed ideas, as well as the fact that calamine leads to disturbances in both (the functional memory and semantic one). The study also concluded that the disturbances of ideas resulting from the use of calamine are connected to the low performance in the tasks of the functional memory. In a statically significant way.

Hannigan (2000) carried out a scientific experiment on a sample of 348 male and female students, divided into two groups: the first group members were offered a number of pictures that followed a certain sequence containing a series of errors, while the other one was offered, another set of pictures in a correct sequence. The results of this study revealed that the amount of recalling in the second group was higher, faster and more accurate than the first group with respect to semantic memory; it was also found that there are differences between the two genders, as females were superior in the speed of recalling whereas males were superior in the amount of recalling.

Badwi's study (2002) aimed at determining the effect of the linguistic performance memory capacity on the information encryption strategies and competency of long-term memorizing. The study sample consisted of (284) primary students, with an average age of 8.87 $\pm$ and 0.30 years. The study found substantial differences between the female students groups in the use of semantic encryption strategies during the performance of audio, semantic and meaningless information tasks and that the semantic task group was the most efficient in the long-term memorizing followed by the audio function group and finally came the meaningless function group. Moreover the female students with the high capacity in the semantic task group excelled in the use of management of information strategy.

Helman *(Helman, 2003)* carried out a study about the effect of distracting attention on learning the rules of language, in a sample of secondary and university students. The study was applied on a number of 564 students, divided into two groups: the first group presented information about the rules of language to its members with the

presence of attention distracters, while the second group presented information about the rules of language without any distracters .The study concluded results confirming that the speed and accuracy of response were better in the first group, compared to the second one.

Brook (Brooke, et al., 2003) studied the structural memory which is associated with the interactions between the adolescent and the father and the effect of the association images on perception and its change over the time. The study included a group of adolescents who participated in a discussion with a number of fathers, and then thy divided the interaction that took place between them and their parents immediately after the end of the debate and that was done again after six weeks. The study concluded that adolescents' immediate perception of the interaction with their fathers was lower on the performance of the performance of semantic memory, while after six weeks their perception of the interaction was more adequate with a greater association image with the father than the immediate perception on the performance of semantic memory.

The study of Eleanor and Christopher *(Eleanor, and Christopher, 2004)* aimed at identifying the extent of correlation between the brain network and the acquisition of meanings and language connotations. The study sample consisted of (65) university students who were examined with the functional magnetic resonance imaging. The results found that the encrypted information is not associated with the brain network activation, and that the patterns of activation depend on the type of learned and acquired material.

Fawkiah Abdel-Fattah (2004) examined the memory capacity, the encryption strategies and its levels for (50) male and female students who are suffering from a deficiency in the memory processes. The researcher used a battery of tests including: the diagnostic test of reading difficulties, memory capacity task, encryption levels tasks, the non-verbal intelligence test, the scale of estimating the student's behavior to sort the cases of learning difficulties, and a list of estimating the children's adaptation. The results showed that the normal students got higher marks on the encryption levels scale concerning the phonological and semantic levels than those suffering from reading difficulties; moreover some differences emerged

between the levels of encryption when the used encryption strategy differed (phonology and semantic level).

Joel's (Joel H. Joel, 2005) Study aimed at identifying the discrimination of semantic memory through the mechanism of activating some areas of the brain cortex. The study sample consisted of (42) of the university students .A test for semantic memory was applied and a magnetic resonance imaging set was used. The results of the study indicated that the having brain disorders lead to a deterioration in semantic memory. The results demonstrated that this deterioration hinders the students' decision-making.

Alexander et al (Alexander, et al., 2006) carried out a study on a group of university students to identify the relationship between anxiety and the optical component of each of semantic memory and the functional memory. The study used the content analysis method through reviewing the previous researches on cognitive-emotional interaction. The results of this study showed that anxiety hinders spatial performance task, but it does not hinder the verbal performance of the functional memory. They also showed that the individual circumstances in the psycho-social measurement of anxiety affects the participants scores during their performance in the optical component test of semantic memory and the functional one and that those persons who have high levels of behavioral Cessation are suffering from severe anxiety and suffering from great problems in the special performance of the functional memory.

Comment on the previous studies:

We conclude from the previous studies that:

1. there is the lake of the Arabic studies related to semantic memory.

2. The studies conducted in this field; despite adding to the scientific knowledge concerning semantic memory, are mostly based on relatively simple experimental designs, and the limits of the followed methical approach is not clear enough whether for the different variables or factors influencing (negatively and positively) the performance competency of semantic memory .

3. The nature or the characteristics of psychometric Tools used in most studies of these subjects, is not clear enough.

Study hypotheses:

The study hypotheses were formulated as follows:

1. Semantic memory competency Increases in the case of verbal information, more than the case of non-verbal one.
2. Semantic memory competency increases in the case of the audio presentation of verbal information than the case of the visual one.
3. Semantic memory becomes less efficient in the case of the audio presentation of the non-verbal information than in the case of the visual one
4. There are no gender differences in performance competency of semantic memory, regardless of the various experimental conditions (information type, presentation method) which were referred to previously.
5. The Predictive ability of the variables of information type and the presentation method differs whenever the performance competency of on semantic memory tests differs.

The study methodology and procedures:

1 – the study methodology

This study uses the experimental methodology, and is committed to its various methodological procedures and the various experimental criteria, whether in regard to ways of the experimental processing of the independent variables, or monitoring the effect of this processing on the extraneous variables or in dealing with the various incidental variables in the experimental situations.

Since the goal of the experiment was to determine the effect of the information type, and the presentation method on the performance competency of semantic memory of the participants of both genders, then the information type and the presentation method in addition to participants' gender represent the independent variables, while the performance of the two semantic memories represent the extraneous variables, and any other variables will be adjusted because it is not an objective of the current study.

The main study sample:

The Study sample consisted of 400 male and female Kuwaiti students (200 male / 200 female) in various specializations in the

University of Kuwait, in Kuwait. These students have been selected randomly from all the different grades as follows: about 100 students from each university grade, ranging in age from 18-24 years, with an average age 21.25 with standard deviation of 1.84 for males, and an average age 20.14 with standard deviation and 2.54 for females.

The researcher used a number of tests to adjust the incidental variables aiming at assuring the homogeneity of the sample in these variables .The most important of these variables are as follows:

1-Controlling the demographical variables Form:

It contains a group of questions and general data about the participants such as age, gender, educational level and socio-economic status and accordingly the demographical variables were controlled according to its data.

2 - The continuous addition of focus attention test:

The test consists of a list of numbers between 1 to 9 and the participant is requested to calculate the number he hears with the previous number quickly and accurately; noting that the time interval between each number is one second .That was used to control the attention focus variable, because as it was indicated in some previous studies, it affects the performance of semantic memory and the factual events memory , therefore the difference in the attention degree of the participants will lead to different results, which makes it internal-variable.

3-Controlling the variable of intelligence:

Kessler Bellevue vocabulary test for adults and adolescents intelligence was used. This test consists of 42 words with progressive difficulty and the participant is asked to provide the meaning of each word of these words. The test application stops when the participant fails in five consecutive words.

What follows is a detailed table of the characteristics of the sample between males and females in the demographic variables and the controlling variables mentioned above.

Table (1) arithmetic means, standard deviations and (t) values clarifying the males and females characteristics in the samples

(according to age and number of the education years)

Samples	males variables	samples	Females variables	samples	T. test	Statistical significance
variables						
age	21.62	1.81	21.45	3.64	0.346	insignificant
Years of education	14.52	1.08	14.72	0.960	0.873	insignificant

The above table shows that there are no statistically significant differences between the male and female students in the (age and years of education) variables, which indicates the equality of the samples in these variables.

Table (2), arithmetic means standard deviations and (t) values, clarifying the characteristics of the males and females samples (according to intelligence and focus attention).

Samples	males variables	samples	females variables	samples	T. test	Statistical significance
Variables						
General intelligence(vocabulary)	8.85	2.33	9.15	2.51	0.599	insignificant
Focus attention	1.97	1.07	1.95	1.15	0.100	insignificant

The above table shows that there are no statistically significant differences between the male and female students in (age, intelligence and focus of attention variables using the continuous addition test), which indicates the equality between the samples in these variables.

Study tools :

1- Neutral words recall test (a) for semantic memory (verbal - visual).

This test consists of 15 neutral words which are presented to the participant on a screen or on a personal computer using a self-organized presentation program (power point) where each word is displayed on the screen for three seconds, and then the participant is asked to recall and write these words in the answers brochure, after the completion of the words presentation.

2- Locating objects test for semantic memory (non-verbal - audio).

The test consists of a room's image with a set of cabinets and shelves carrying different objects The participant is asked to search for the thing he is asked to find, and identify its place in the room and the shelf where it is placed, then he asked to find ten objects related to semantic memory.

3 The short-story memory test for semantic memory (verbal - audio). The researcher used Kessler Bellevue memory scale, translated by Lewis Kamel Malikah (1990), in the composition of this test .The scale tests are composed of two stories which the participant is asked to recall separately after listening to it. The test includes a story listened to by the participant through the computer .After he has listened to it, he is required to answer five questions related to the factual events memory in the answer sheet.

4 – Images visual identification test for semantic memory (non-verbal - audio). The Test consists of 15 image of many objects, each image is displayed on the screen using images presentation program. The images are neutral, and each is shown for a period of three seconds, and then the participant is asked to identify each image from a group of the three images, one of them was seen before by the participants while the other two images were not seen. He is asked to write down the answers in the answer sheet.

5 - Recalling the situations and events tests for semantic memory (non-verbal - visual). This test consists of three parts, in the first part 15 images are presented; these images are of personal contents and experiences which the individual passes by through his daily life, and by which he is affected .It is displayed on a screen or on a PC through " Power Point "for 3 seconds. In the second part of the instructions, the participant is required to recall the images and to write their names in the answer sheet after the end of the presentation, while in the third part the participant is required to recall the emotional state represented in this images and the feelings and the memories which they arouse in him.

6 - Words recall Test (b) for semantic memory (verbal - audio). This

test consists of 15 neutral words presented to each participant in an audio way then the participant is asked to recall and write these words in the answer sheet after the end of the presentation.

7 - Neutral images classification test for semantic memory (non-verbal - visual).

The test consists of fifteen images including images of fruits, vegetables, tools and means of transportation, and is displayed all at once randomly for 45 seconds. Then the participant is asked to recall the name of each of them and classify it in the lists of the answer sheet.

8. Words visual identification test for semantic memory (verbal - visual): the test consists of two parts; the first part consists of 15 words, each word is displayed on the screen using a displaying program. These words are emotionally loaded, and each of them appears for three seconds, then the second part displays three words, one of which was seen before by the participants while the other two images were not seen, then the participant is asked to identify the words that he had already seen, and to write them in their place in the answer sheet.

Thirdly: The standard competency of semantic memory tests: To verify the standard competency of the study tests, these tools were applied on the aforementioned exploratory sample, (n = 80) participants from the Kuwait University students (males = 40, females = 40) , a similar sample to the main one, and the average age of a sample of male = 22.35 ± 3.15 and the average age of the female sample= 21.95 ± 2.85.The exploratory sample consisted of different specializations and grades starting from the first year until the fourth year, and all the sample members were of Kuwaiti students. The validity and reliability of the study tools were calculated as follows:

1-Study tools reliability:

Reliability in the current study was calculated using three methods, and the following table shows the reliability coefficients that have been extracted for the male and female groups of the tests used in this study in different ways.

A - Reliability coefficients of semantic memory tests.

Table (3)
Reliability coefficients of semantic memory tests

Referential samples and tests Experimental tests	Number of items	Males (n= 40)			Females (n= 40)		
		Alfa	Semi division	Retest	Alfa	Semi division	Retest
Words recall Test(a)	15	0.76	0.82	0.73	0.72	0.79	0.76
locating objects test	10	0.64	0.68	0.71	0.66	0.70	o.68
short story memory test	5	0.67	0.72	0.72	0.65	0.67	0.78
Images Visual identificatiion test	15	0.82	0.78	0.73	0.79	0.72	0.75
Words recall test (b)	15	0.80	0.77	0.78	0.76	0.72	0.79
Words Visual ientifiction test	15	0.70	0.73	0.84	0.67	0.70	0.80
Neutral images classification test	15	0.87	0.91	0.86	0.79	0.81	0.82
Recalling the situations and events test	15	0.90	0.94	0.89	0.88	0.90	0.85

The previous table shows the reliability of the battery of the basic tests for semantic memory, through doing the retest, on (40) of males and (40) females, and then calculating the correlation coefficient between the scores from the two phases of tests application using Person correlation coefficient The reliability coefficient of the

males sample ranged between (0.76 - 0.89) and (0.68 - 0.85) for females sample.
The researcher also calculated the reliability through alpha Kronbach coefficient and found that the reliability coefficient on the study tools of males sample ranged between (0.64 - 0.90) and (0.65 -0.88) for the female sample.

In The third type of reliability the mid-division was used and the length was compensated with Jetman equation, which is the adequate reliability when the standard deviations of the test parts are not equal, and it is also adequate when this standard deviations are equal (Ahmed Ghoneim, Nasr Mahmoud, 2000, p. 260), The tools reliability coefficients of males sample ranged between (0.68 -0.94) and (0.67 - 0.90) for the females sample.

.When we examine the previous reliability coefficient tables, which was calculated in various ways, it appears that most of them were high.

2. Validity of the study tests:

The validity in the current study has been calculated in three ways. The following table shows validity coefficients of the tests used in this study which was extracted for the two groups of males and females'

table (4) validity coefficients of semantic memory tests

Referential samples and test / Experimental tests	Referential tests	Males (n=40)		Females (n=40)	
		co-relational benchmarking validity	Extreme Comparison validity	co-relational benchmarking validity	Extreme Comparison validity
Words recall Test(a)	Words audio identification test (Asabop, 1994	0.82	3.95**	0.77	2.38**
locating objects test	Bandar gestalt test	0.69	4.95**	0.75	4.48**
short story memory test	The stories memory (Wakessler of memory)	0.77	3.36**	0.73	3.67**

Referential samples and test / Experimental tests	Referential tests	Males (n=40)		Females (n=40)	
		co-relational benchmarking validity	Extreme Comparison validity	co-relational benchmarking validity	Extreme Comparison validity
Images Visual identification test	Bandar gestalt test	0.84	4.32**	0.77	3.96**
Words recall test(b)	Words audio identification test(Asabop, 1994	0.79	4.22**	0.74	3.33**
Words Visual identification test	Bandar gestalt	0.77	4.25**	0.75	3.83**
Neutral images classification test	Bandar gestalt test	0.75	4.23**	0.96	4.10**
Recalling the situations and events test	----	----	3.88**	-----	4.11**

The previous Table shows the validity of semantic memory tests through two ways, co-relational benchmarking validity and the extreme comparison. The validity coefficient of male sample ranged from a (0.69 - 0.84), and (0.73 -0.96) for the female sample. The second type of validity that was used is the extreme Comparison validity, where the (U) value of the males sample ranged from (3.88 - 4.59), to (2:38 to 4:48) for females sample, which meant that there are statistical significance between grade averages at the significance level 0.01

Study results:

1. Results Presentation

To test the first hypothesis, which was that semantic memory competency increases in the case of the verbal information, more than the case of non-verbal information, the researcher calculated the T. test for the Paired – Sample-t-test of the differences significance between the

arithmetic means which are used in the presence of one group, and we collect data from it, when it is exposed to two different situation. The T. test has resulted in the results illustrated by the following table:

table (5) the differences significance between the arithmetic means of semantic memory competency in processing verbal and non-verbal information for the total sample

information type Memory type	Verbal information case		non-verbal information case		T. test
	variable	sample	variable	sample	
Semantic memory	77.28	4.782	96.03	5.266	48.735**

Statistical significance level (0.001)

The above table shows that the participants in the case of the non-verbal information are more competent in semantic memory performance compared to the verbal or audio information.

To test the second hypothesis, which is that semantic memory competency increases in case of audio presentation of verbal information more than in case of visual presentation, the following table was used to shows the results of this hypothesis. Table (6) differences significance between the arithmetic means of semantic memory competency in case of verbal and audio presentation of verbal information for the total sample

information type Memory type	Audio presentation of verbal information		Visual presentation of verbal information		T. test
	variable	sample	variable	sample	
Semantic memory	32.185	2.08	45.09	3.35	**9.35

Statistical significance level (0.001)

The above table shows that the participants in the case of visual presentation of verbal information are more competent in semantic memory performance.

3 - To test the third hypothesis which includes that, semantic memory competency decreases, in case of audio presentation of non-verbal information more than visual presentation, the following table was used to show the result of this hypothesis

Table (7) differences significance between the arithmetic means of semantic memory competency in case of audio and visual presentation of non-verbal information

information type ⟍ Memory type	Audio presentation of non-verbal information		Visual presentation of non-verbal information		T. test
	variable	sample	variable	sample	
Semantic memory	44.91	2.46	51.12	3.76	34.91

Statistical significance level (0.001)

The above table shows that the participants are more competent in semantic memory performance in case of the visual presentation of non-verbal information.

Fourth: the differences between males and females performance on semantic memory tests.

To verify the validity of the first part of this hypothesis, the researcher calculated the (t) values of the differences significance between arithmetic means of males and female performance on semantic memory tests. The (t)values has given the results illustrated by the following table:

Table (8) differences significance between arithmetic means of males and female performance on semantic memory tests:

The test	males		females		T. test
	variable	sample	variable	sample	
Word recalling test(a)	24.88	1.65	22.25	1.74	3.71**
Short stories memory test	7.58	1.94	9.77	0.445	15.51**
Word recalling test (b)	22.97	1.89	21.97	2.01	5.13**

The test	males		females		T. test
	variable	sample	variable	sample	
Words Visual identification Test	23.31	2.19	20.73	2.14	7.32**
Locating objects test	19.13	0.872	19.23	0.769	1.22
Images identification Test	24.28	2.19	26.16	2.00	4.19**
Recalling situations and events test	25.87	2.48	27.67	2.20	3.43**
Images classification test	25.01	2.43	24.67	2.24	1.41

\Statistical significance level (0.001)

Table (35) clarifies the significant differences between males and females in semantic memory (word recall test (a), word recall test (b), and words Visual identification test) for the males. There were also significant differences between males and females in the (short story memory test, images identification Test, and recalling situations and events test) for the females. Differences between males and females were not clear in the case of visual information of semantic memory (locating objects test, and images classification test .

Fifth: The variables predictive ability of the information type and presentation method differs as the performance competency on semantic memory tests differs.

Table 9:standard multable regression to know the independent variables that can predict the competencey of the semantic memory

		2R	Beta	f	Value	2R	Beta	f	T	R 2	Beta	f	T value
Word Recall(A)	Information Type	394.0	628.0	**06.128	**35.11	499.0	706.0	**25.197	**04.14	466.0	0.683	**4.347	**64.18
	Method of presentation	064.0	254.0	**62.13	**69.3	0120.0	346.0	***42.26	**184.5	109.0	330.0	**61.48	***87.10
Word Recall(B)	Information Type	564.0	751.0	**5.256	**01.16	710.0	843.0	**530.484	**01.22	663.0	814.0	**1.784	**02.28
	Method of presentation	922.0	960.0	**99.235	**51.48	953.0	976.0	**13.4018	**39.63	941.0	970.0	*4.6330*	**59.79
Image Recognition	Information Type	10.0	102.0	081.2	44.1	014.0	119.0	361.2	291.1	029.0	169.0	**71.11	**422.3
	Method of presentation	011.0	105.0	196.2	482.1	010.0	100.0	010.2	418.1	020.0	143.0	**276.8	*877.2
Images Categorizati on	Information Type	003.0	056.0	633.0	796.0	000.0	008.0	012.0	111.0	002.0	045.0	809.0	899.0
	Method of presentation	003.0	52.0	535.0	731.0	016.0	127.0	26.3	81.1	00.0	020.0	157.0	396.0
Objects locations test	Information Type	008.0	091.0	64.1	28.1	001.0	038.0	283.0	532.0	000.0	005.0	009.0	092.0
	Method of presentation	002.0	046.0	415.0	644.0	008.0	089.0	574.1	255.1	001.0	003.0	402.0	634.0
Stories Memory	Information Type	074.0	272.0	**82.15	***08.3	028.0	167.0	**676.5	*383.2	003.0	054.0	**2.411	**63.22

24

Test		055.0	235.0	**62.11	**41.3	077.0	287.0	**56.16	**07.4	056.0	237.0	**64.23	**862.4
Situations Memory Test	Method of presentation												
	Information Type	011.0	107.0	*283.4	*511.2	130.0	361.0	**65.29	**446.5	074.0	272.0	**81.31	**640.5
	Method of presentation	017.0	132.0	*49,4	*899,2	090.0	300.0	**64.19	**432.4	058.0	241.0	**60.24	**960.4
Words Visual identificatio n Test	Information Type	602.0	776.0	**4,299	**3.17	752.0	867.0	**67.599	**49.24	708.0	842.0	**8.965	**08.31
	Method of presentation	131.0	361.0	**75.29	**45.5	370.0	611.0	**98.117	**86.10	273.0	522.0	**2.149	**23.12

By reviewing the above table and checking the data it presents, the following psychological results could be included:

1. The information type and presentation method have a high predictive ability of recalling words (a) of the semantic memory for both males and females, and the total sample, what indicates the ability of these variables to predict the competency of the words recall.

2. The information type and presentation method have a high predictive ability of recalling words (b) of the semantic memory for both males and females, and the total sample, what indicates to the ability of these variables to predict the competency of the words recall.

3 - The information type and presentation method have a high predictive ability to identify images of semantic memory, in the total sample, what indicates the ability of these variables to predict competency in images identification

4 - There is no predictive ability of the information and its presentation method on both the image classification, and locating objects in males and females, and the total sample, what indicates to the inability of these variables to predict the competency in the identification of the Image classification, and locating objects.

5 - The information type and presentation method have a high predictive ability of the stories memory of semantic memory in both males and females, and the total sample, what indicates the ability of these variables to predict the competency of the stories semantic memory.

6 - The information type and presentation method have a high predictive ability of remembering events and situations of semantic memory in both males and females, and the total sample, what indicates the ability of these variables to predict the competency of remembering events and situations.

7 - The information type and presentation method have a high predictive ability of words optical identification in semantic

memory for both males and females, and the total sample, what indicates the ability of these variables to predict the competency in words identification.

Discussion of the Results:

First: the results of the first , second and the third hypothesis showed their validity, which resulted in that fact that when the participants are exposed to non-verbal information with a visual nature they become more competent in the performance of semantic memory, and when verbal information is presented to the participants visually they become more competent in the performance of semantic memory .The participants become also more competent in the performance of semantic memory in the case of visual presentation of non-verbal information.

Judith C, Lapadat study has agreed with Jack Martin (Judith, & Jack, 1994) on the results of the preceding sub-hypotheses I, II and III, what indicated the statically significant impact, of the use of visual materials (non-verbal) during the lecture to increase the retention of the information, and it was also found that those who prefer a visual material have a more tendency to think of embodied materials or those which can be embodied and visualization compared to verbal material.

The results of Judith C, Lapadat's and Martin's study supports the results of the current study and those of (Niyo Paivio, 1986) through his dual symbolic theory that image embodiment through lectures help adolescents to recall all the personal and advertising information. Martin and Lapadat also concluded that there were differences among adolescents who wrote reports on the high level preferences for visual material, and those who wrote reports on their preferences for methods of verbal learning associated with the amount of personal information, which will be remembered initially, and which is recalled over time (Judith, & Jack, 1994, pp.266-285).

Therefore, it is clear that there is an effective use of illustration means and visual materials in lectures which increases the importance to retain the information (Abu Makarim, 2001), as the content of the material presented using the projector and embodying it in the form of images in the classroom environment helps adolescent students to

recall the main ideas of the lecture. These findings support the assumptions of dual symbolism in increasing the performance of semantic memory (Mayer, R & Anderson, R, 1991, P.485), and that enhancing the effectiveness of the use of visual materials in education helps to learn and retain the information (Snowden, et al, 1996, p.1101)).

This supports the memory definition in general, which is that it is the capacity for storing sensory information, especially audio and video one, for longer or shorter periods according to its importance, type, and method of storage, with the aim of recalling it after a period of time. Thus the process of remembering is considered a recalling process of past experiences which are previously learnt by the individual, and it includes three different phases: the information encryption, storage and retrieval (Linda Davidoff, 1999, p. 36).

Second: The results of the fourth hypothesis showed its partial validity , as its results concluded that males' average performance is significantly higher than the females' average performance on words recall tests of (a), words recall (b), and words visual identification.

There were statically significant differences between males and females were in the short story memory test, images identification test , and remembering the events and situations for females.

There were no differences between males' and females' performance on the test of spatial non-verbal information – of semantic memory, locating objects test , and images classification test. This finding as a whole corresponds with the study of (Brooke, et al, 2003) and (Hannigan, 2000)), which concluded that males' perception when the performance was on the verbal semantic memory tests compared to their performance on visual semantic memory tests.

The previous result can be interpreted in the light of the fact that most semantic memory tests are of visual information, and this was confirmed by Rickard and his colleagues that this type of information increases the speed and volume of the recalled material (learnt) (Rickard and Bajic, 2006,pp734-748).

The researcher indicates to the fact that the reason for females' superiority in semantic memory tests is due to a number of points, the first point: is due to the fact that females have a great ability to process

verbal, linguistic and symbolic information more efficiently than males , and that they have the bases of semantic memory performance; Examples of such information include: mathematics, chemical equations, scientific theories of any science, grammar, and the facts that do not relate to time or place, and this means that an present or past realistic events, as memories are not included in this memory because the nature of its information (i,e semantic memory) is cognitive, and is based mainly on concepts, facts, principles, rules, and other cognitive contents (Alice, 2003, p.483).

The second is due to the relation of the female cognitive structure to some mental components such as mental representation and the arrangement and classification of recalled events (Sternberg, 1983).

The third: Females' superiority in semantic memory isn't ungrounded, but its importance is reflected through this memory interpretation of nature around us including various colored shapes and the impressions which we perceive with our minds and the description of this nature through our original language which includes many types and classifications (Elizabeth, 2004).

The fourth: the reason for females superiority in semantic memory tests is due to their distinction in acquiring information, meanings, and rules efficiently compared to males .This may be due to what the theory of social learning presents whose rules were set by Bandara (Bandara,) who believes that individuals especially females ,gain a large amount of information from their social environment, so they get acquainted with desirable and undesirable behaviors, so the acquisition of meanings, general principles, skills, attitudes and beliefs is done simply through observing what the others do (Philip & Ann, 1997: 412).

Secondly: The results of the fifth hypothesis illustrated the validity of this hypothesis as the results of this hypothesis were as follows:

(1) the information type and its presentation method have a high predictive ability of words recall (a) words recall (b), remembering the events and events, the visual identification of words of semantic memory in the male and female samples, and the total

sample, what indicates the ability of these variables to predict the performance competency on of these tests.

(2) There is a lack of predictive ability of the information type and presentation method on each of: images classification, locating objects' places,of semantic memory, in both the male and female samples and the total sample, what indicates the inability of these variables to predict the performance competency of semantic memory of the teenagers.

3) The information type and its presentation method have a high predictive ability of the short-story memory of semantic memory, in both male and female samples, and the total sample, what indicates the ability of these variables to predict the competency of semantic memory of short story test .

This result agreed in general with the study of (Graf and Utti, 1996) which indicated that the presentation method of information foretells the competency of semantic memory.

This result could be explained in the light of semantic memory relation to the cognitive framework which reflects our organized knowledge concerning the world around us, and which is based on the use of harmonious knowledge as it includes the knowledge of concepts, words, facts, rules, the laws, and connotations. It also includes many objects that you know and can not be expressed in words only but there must be visual stimuli presented in a way that is closer to the feelings of the participants (Al-Zayat, 1998, p. 167); Elizabeth, 2004, p. 106).

This result could also be explained through the personality theories and specially the phenomenological perspective which is one of the main entrances that provided explanations on personality , and linked it to the information side(cognitive) which was adopted by Albert Bandora, in which this perspective confirmed that our perception of objects and meanings is not the same as the object itself or as it is in reality, or with its objective characteristics, but there are characteristics and rules which determine the perception processes, what illustrates the importance of the information type , its presentation method and the extent of this individual's response to this information.

The relationship between the information type, the presentation method and semantic memory reflects the effectiveness of cognitive representation and the active representations to semantic memory, and it also extends to long-term memory, where the semantic memory includes many of the stable cognitive units, with high correlations related to each of the normative and procedural knowledge. Semantic memory lies also behind the activity of encryption processes in the functional memory (Zayat, 1998, p. 151). Thus, the existence of such a relationship foretells the competency of semantic memory.

This result illustrates the form of the relationship between information content and semantic memory, since it is most like the relationships between learning inputs and outputs, where the information its qualitative and quantitative characteristics , its included concepts, , facts, rules, laws, and theories constitute the cognitive units that compose semantic memory, Which in turn follows many bases or organizational patterns that lie behind the individual's ability to receive and process information (Anna, et al, 2005, p 1483).

Report on the current study theoretical and practical contribution in the field of experimental cognitive psychology researches:
Theoretical Contributions:
(1) This study sheds light on the importance of the study subject, especially with the scarcity of Arabic studies - According to the researcher's knowledge - which draws the researcher's attention to conduct further research on the same samples or on other samples such as the elderly people or normal children and those with special needs.

(2) The study drew attention to the nature of the role of visual information in the performance competency of semantic memory.

(3) The study drew the attention to the nature of the role played by the visual presentation of verbal information in the performance competency of semantic memory.

(4) The study drew attention to the fact that the presentation of visual information, in a visual way increases the performance competency of semantic memory.

Practical Contributions:

(1) The current study contributed to providing tools with good psychometric competency – according to the limits indicated by the psychometric characteristics of the tests - to measure a number of variables of great interest to researchers at present time, which is semantic memory, and to providing a full battery for each of them containing visual and audio components.

(2) These findings would contribute to the planning of preventive programs of memory disorder, so that they would include programs for the development of information type, presentation methods and its content, and which may in turn contribute to raising the competency of semantic memory.

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